DOCUMENT RESUME

ED 135 943 CE 009 328

TITLE	Modules in Agricultural Education for Agricultural Production.
INSTITUTION	New York State Education Dept., Albany. Bureau of Occupational and Career Curriculum Development.
PUB DATE	Jun 74
NOTE	839p.; For related documents see CE 007 550, CE 008 147-148, CE 008 151, CE 009 326-328, ED 105 080 (Modular Design Approach for Agricultural Education), and ED 105 296 (Module Directory for Agricultural Education) ; Not available in hard copy due to print quality of original
EDRS PRICE	MF-$1.50 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	Agribusiness; *Agricultural Education; *Agricultural Production; Agricultural Skills; Animal Science; Instructional Materials; Learning Modules; Plant Science; Skill Development; *Vocational Agriculture

ABSTRACT

Each of the 61 modules in this packet contains a brief description of the module contents, a list of the major division of units, the overall objectives, objectives by units, content outline, and suggested teaching method, student application activities, and evaluation procedures. A list of resource materials is also included for each. Some of the module titles are Producing Quality Milk; Dairy Cattle Breeding; Dairy Health and Disease; Beef Production; Handling the Foal; Harness Training of Horses; Swine Production; Sheep Production; Poultry Production; Selecting and Handling Dogs and Cats; Care of Birds; Care and Maintenance of Tropical Fish; Care and Handling of Reptiles and Amphibians; Care and Handling of Small Animals; Handling of Primates; Internal and External Parasites of Animals; Sterilization, Disinfection and Sterile Packs; Repair of Equipment; Care and Growing of Insects; Planning a Breeding Program (Livestock); Planning the Cropping Program; and Harvesting the Crop. (HD)

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MODULES IN AGRICULTURAL EDUCATION
FOR

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EDUCATION & WELFARE
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agricultural production

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of Occupational and Career Curriculum
Albany, New York 12234

CE 009 328

MODULE OF INSTRUCTION

Title - PRODUCING QUALITY MILK

Code - 01.01010101-01

DESCRIPTION:

Students will develop skills needed to produce high quality fluid milk for consumption.

Emphasis will be given to the detection and control of factors which affect milk quality, proper procedure for milking cows, interpretation of milk quality tests, and compliance with herd health regulations.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Factors Affecting Milk Quality	4	14
2. Proper Milking Procedure	2	5
3. Planning to Produce Quality Milk	1	4
	7	23

Revised June 1974

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MODULE OF INSTRUCTION

Title - PRODUCING QUALITY MILK

Code - 01.01010101-01

Objectives to be obtained:

The student will be able to:

1. Identify five of the most common off flavors of milk by taste test.
2. List two possible causes for each of the off flavors identified.
3. Identify ten probable causes of off flavor milk on a given dairy farm.
4. List ten important farm requirements of the local milk inspection agency, which relate to quality milk production.
5. Correctly interpret bacteria, sediment, modified whiteside reaction, and antibiotic test results from given samples.
6. Explain the milk secretion and milk ejection process. Correctly list the anatomy and function of each part of the udder and mammary system.
7. Define oxytocin, the milk secreting hormone and its influence on milk letdown.
8. Prepare a cow for milking and successfully milk the cow following recommended procedures.
9. Prepare a planned program for producing quality milk on a given farm which meets the instructor's approval.

Code - 01.01010101-01

Title - PRODUCING QUALITY MILK

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Factors Affecting Milk Quality. Objective 1 Identify the five most common off flavors of milk by taste test.	A. Milk flavors and causes listed in: . Producing Good Tasting Milk - Cornell Ext. Bulletin #1171. . Milk Flavor Handbook - Tri-State Milk Flavor Program (New Jersey, New York, Pennsylvania) . Producers Milk Flavors Chart - available from extension service . Milk Flavor Defects - Their Causes and Prevention - Extension Service, University of Vermont
Objective 2 List two possible causes for each of the off flavors identified.	A. Causes of off flavors as in materials listed for Objective 1. . Feed, barny or cowy, salty, rancid . Malty, high acid, oxidized, unnatural

Objective 3 - Identify ten probable causes of off flavor milk on a given dairy farm.	A. Causes of off flavor as in materials listed for Objective 1.
	. Cleaning and sanitizing utensils
	  . Managed Milking - Bulletin 1193, pp. 10-12
	  . The Sanitary Care of Milking Equipment on the Farm - Bulletin 941
	. Feeding
	. Poor sanitation
	  . stables
	  . cows
	  . milk room
	. Mastitis
	. Poor cooling
	. Medications
	. Ventilation problems
	. Chemical contaminants

01.01010101-01 - Code

PRODUCING QUALITY MILK - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion - define good quality milk. Discuss off flavors and causes. B. Prepare samples for student testing. C. Invite a local milk company fieldman to discuss and show examples of the causes of off flavor milk.	A. Students will take notes on materials not in student references. B. Study Producing Good Tasting Milk - Bulletin #1171 C. Taste-test prepared samples. D. Students prepare samples under farm conditions for taste testing.	A. Students should correctly identify five common flavors from given samples prepared by the instructor.
A. Lecture discussion B. Lab demonstrations C. Evaluate samples from home farms	A. Study Producing Good Tasting Milk - Bulletin #1171 B. Prepare off flavor samples under farm conditions.	A. Written test in conjunction with Objective 1. (sample attached) B. Test on unknown samples.
A. Lecture discussion B. Farm visits . Observe conditions . Utensils . Milk rooms . Equipment . Stables . Feeding systems . Feeding schedules	A. Study Bulletin #1171 B. Study pp. 10-12 of Bulletin #1193 C. Locate possible causes of off flavors under farm conditions. D. Correct situations on a farm that may be leading to off flavors.	A. Students will find and describe 10 situations on farm that may cause off flavor milk. B. Students will score their own farm using a uniform dairy standard inspection report.

Code - 01.01010101-01

Title - PRODUCING QUALITY MILK

OBJECTIVES BY UNIT	CONTENT
Objective 4 List 10 important requirements of the local milk inspection agency which relate to quality milk production.	A. State and local requirements for milk producers . Handbook of Regulatory Rules . Dairy Farm Sanitation Report . New England Uniform Dairy Standard Dairy Farm Inspection Report - H.P. Hood & Sons, Boston, Massachusetts
Objective 5 Correctly interpret bacteria and sediment that results from given samples.	A. Standard plate court (bacteria) B. Modified whiteside reaction (abnormal milk) C. Antibiotic test D. Sediment test
Unit 2 - Proper Milking Procedure. Objective 6 - Explain the milk secretion and milk ejection process. List the anatomy and function of each part of the udder.	A. Parts of mammary system B. Milk secretion process C. Milk ejection process
Objective 7 Define oxytocin, the milk secreting hormone and its influence on milk letdown.	A. The role of oxytocin and milk secretion-ejection. B. Causes of poor milk letdown.

EDUCATION

01.01010101-01 - Code

PRODUCING QUALITY MILK - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Resource personnel field man or other qualified people review a field inspection report. B. Field trip - observe an inspection on a farm.	A. Take notes from guest speaker. B. Observe farm inspection. C. Discussion and individual study of regulatory rules	A. Written test (sample attached)
A. Resource personnel - field man and technicians to demonstrate tests. B. Lecture discussions. C. Use of forms for reporting tests.	A. Students will take notes on how tests are run, what they measure and how to interpret them. B. Students will observe testing of samples. C. Students will practice interpreting test results laboratory exercise.	A. Written test (sample attached)
A. Movie - Miracle of Milk or Science of Milk Production. B. Lecture discussion. Laboratory using cows udder from a slaughter house. C. Field trip to observe a herd being milked . Cow preparation . Complete milking . Sanitation practices used on the farm . Medication for infected quarters	A. Study Bulletins 1193 and 955, and the importance of proper preparation for better milking. B. Observe dissection of cows udder. C. Observe effects of different techniques on milk ejection on farm visit.	A. Written test matching questions on the anatomy of the udder and mammary system. B. Essay question on the secretion of milk. C. Performance grade observing students milking - work experience program extra credit.
A. Chalk and board session. B. Class discussion on milking speeds of dairy animals.	A. Students take notes on teacher presentation. B. Students describe experience related to their work experience programs.	A. Essay question on the milk secreting hormone, oxytocin.

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Title - PRODUCING QUALITY MILK

OBJECTIVES BY UNIT	CONTENT
Objective 8 Prepare a cow for milking and successfully milk the cow, following recommended procedures.	A. Managed Milking, Bulletin #1193, pp. 2-12. B. Recommended Milking Practices, Bulletin #996, pp. 9-16. C. Producing Good Tasting Milk, Cooperative Extension of New Jersey, New York and Pennsylvania.
Unit 3 - Planning to Produce Quality Milk. Objective 9 Prepare a planned program for producing quality milk on a given farm, which meets the instructor's approval.	A. Plan requirements include: . Current farm situation - use results and sanitation reports . Possible causes of off flavor . Recommendations for correcting the situation

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion B. Demonstration C. Slides - The Cow's Udder and How It Functions - Cornell IMS D. Film - "The Science of Milk Production" - Rallston-Purina Company	A. Study Bulletins #1193, #996 B. Observe demonstrations and practice milking procedure C. Students prepare and correctly milk cows on the home farm or cooperative farm.	A. Observe student milking cow, checking . Washing-stimulation . Application . Udder checking and machine removal . Teat dipping . Time intervals B. Performance grade by teacher or cooperative farmer.
A. Lecture-discussion B. Individual instruction . Classroom . Supervised farm instruction C. Veterinarian as a resource person to describe to the class an approved program for producing quality milk.	A. Prepare farm plan for producing high quality milk. B. Oral reports by students describing their programs. Students define strong and weak points of their programs. C. Students take notes. D. Students ask specific questions regarding problems on their farms.	A. Evaluate plan. B. Self-evaluation by students. Hand in evaluations to instructor for a grade. C. Written test on highlights of visiting veterinarian's presentation. D. Written report on student's evaluation of guest speaker. Grade by the instructor.

MODULE OF INSTRUCTION

Title - PRODUCING QUALITY MILK Code - 01.01010101-01

RESOURCE MATERIALS

BOOKS

Teacher

Dairy Production (2nd edition), Diggins & Bundy, Prentice Hall, Inc. Englewood Cliff, New Jersey

Milk Flavor Handbook - Tri-State Milk Flavor Program (New Jersey, New York, Pennsylvania)

BULLETINS

Teacher

1. The Sanitary Care of Milking Equipment on the Farm, Cornell Extension Bulletin 941.
2. Recommended Milking Practices, Cornell Extension Bulletin 996
3. Managed Milking, Cornell Extension Bulletin 1193
4. Producing Good Tasting Milk, Cornell Extension Bulletin 1171
5. The Importance of Proper Preparation for Better Milking, Dairy Equipment Company (IMS was source).
6. Dairy Farm Sanitation Report - local milk plant.
7. The Cow's Udder and How It Functions, University of Illinois Vocational Agriculture Service, Urbana, Illinois.
8. Good Tasting Milk, Vermont Agriculture Extension Service Brieflet 9, 56.
9. The Story of Milk, IMS.

Student

Bulletins from teacher reference list #1, 2, 3, 4, 5 and 6. If available, 7 and 8.

BRIEFLETS

1. Milk Under the Microscope, Vermont Extension Service, University of Vermont, Brieflet 1060.
2. Milk Flavor Defects - Their Causes and Prevention, University of Vermont Agricultural Extension Service.

CIRCULARS

1. State of New York, Department of Agriculture and Markets, Albany, New York 12226. Circular 929 - rules and regulations for sampling and testing milk and cream for fat content.
2. Bovine Mastitis, The Most Costly Problem of the Dairy Industry. ARS 91-89, May 1970. U.S. Department of Agriculture Research Service. Hyattsville, Maryland 20782 - the abnormal milk program, pp. 6-9.

RESOURCE MATERIALS (continued)

PERIODICALS
1. Dairyman's League News
2. A.D.A. and D C Reporter
3. Eastern Milk Producers Cooperative
4. Milk Marketing Releases
5. Hoards Dairyman

AUDIOVISUALS
1. Miracle of Milk - American Dairy Association - local office or Chicago, Illinois.
2. Science of Milk Production, Ralston Purina Company, Checkerboard Square, St. Louis, Missouri.
3. Whiteside reaction and sediment test comparison photographs, G. Hadley Smith, Carey Building, Ithaca, New York 14850.
4. The Cow's Udder and How It Functions (filmstrip, 43 frames), IMS.

Form A193 M 2/69
H.P. Hood & Sons

NEW ENGLAND UNIFORM DAIRY STANDARD

Dairy Farm Inspection Report

POST IN MILKROOM

Inspected For Sale In

☐ Maine ☐ Massachusetts
☐ New Hampshire ☐ Connecticut
☐ Vermont ☐ Rhode Island

Permit No. ....
Expiration Date ....
Pounds Sold Daily ....
Plant ....
....

Name.................................... Location...

Signature of Producer...

SIR: An inspection of your dairy has this day been made, and you are notified of the violations marked below with a cross (X).

		YES	NO
COWS			
1. Abnormal Milk: (15)			
Cows secreting abnormal milk, milked last or in separate equipment	(a)	☐	☐
Abnormal milk properly handled and disposed of	(b)	☐	☐
Proper care of abnormal milk handling equipment	(c)	☐	☐
MILKING BARN, STABLE, OR PARLOR			
2. Construction:			
Floors, gutters, and feed troughs of concrete or equally impervious materials; in good repair (2)	(a)	☐	☐
Walls and ceilings smooth, painted or finished adequately; in good repair; ceiling dust-tight (1)	(b)	☐	☐
Separate stalls or pens for horses, calves, and bulls (1)	(c)	☐	☐
Adequate natural and/or artificial light; well distributed (1)	(d)	☐	☐
Proper feed storage facilities (1)	(e)	☐	☐
Properly ventilated; no overcrowding (2)	(f)	☐	☐
3. Cleanliness: (2)			
Clean and free of litter	(a)	☐	☐
No swine or fowl	(b)	☐	☐
4. Cowyard: (2)			
Graded to drain; no pooled water or wastes	(a)	☐	☐
Cowyard clean; cattle housing areas properly maintained	(b)	☐	☐
No swine	(c)	☐	☐
Manure stored inaccessible to cows	(d)	☐	☐
MILKHOUSE OR ROOM			
5. Construction and Facilities:			
Floors (1)			
Smooth; concrete or other impervious material; in good repair	(a)	☐	☐
Graded to drain	(b)	☐	☐
Drains trapped, if connected to sanitary system	(c)	☐	☐
Walls and Ceilings (1)			
Approved material and finish	(a)	☐	☐
Good repair (windows, doors, and hose port included)	(b)	☐	☐
Lighting and Ventilation (2)			
Adequate natural and/or artificial light; properly distributed	(a)	☐	☐
Adequate ventilation	(b)	☐	☐
Doors and windows closed during dusty weather	(c)	☐	☐
Vents and lighting fixtures properly located	(d)	☐	☐
Miscellaneous Requirements (2)			
Used for milkhouse operations only; sufficient size	(a)	☐	☐
No direct opening into living quarters or barn, except as permitted by Regulation	(b)	☐	☐
Liquid wastes properly disposed of	(c)	☐	☐

		YES	NO
Cleaning Facilities (2)			
Two-compartment wash and rinse vat of adequate size	(a)	☐	☐
Suitable water heating facilities	(b)	☐	☐
Water under pressure piped to milkhouse	(c)	☐	☐
6. Cleanliness: (3)			
Floors, walls, windows, tables and similar non-product contact surfaces clean	(a)	☐	☐
No trash, unnecessary articles, animals or fowl	(b)	☐	☐
Pesticides and medicinals not stored in milkhouse	(c)	☐	☐
TOILET AND WATER SUPPLY			
7. Toilet: (5)			
Provided; conveniently located	(a)	☐	☐
Constructed and operated according to Standards	(b)	☐	☐
No evidence of human wastes about premises	(c)	☐	☐
Toilet room in compliance with Standards	(d)	☐	☐
8. Water Supply: (5)			
Constructed and operated according to Standards	(a)	☐	☐
Complies with bacteriological standards	(b)	☐	☐
No connection between safe and unsafe supplies; no improper submerged inlets	(c)	☐	☐
UTENSILS AND EQUIPMENT			
9. Construction: (3)			
Smooth, nonabsorbent, corrosion-resistant, nontoxic materials; easily cleanable; seamless hooded pails	(a)	☐	☐
In good repair; accessible for inspection	(b)	☐	☐
Approved single-service articles; not reused	(c)	☐	☐
Strainers, approved design	(d)	☐	☐
Approved CIP milk pipeline system	(e)	☐	☐
10. Cleaning: (5)			
Utensils and equipment clean	(a)	☐	☐
11. Sanitization: (5)			
All multi-use containers and equipment subjected to approved sanitization process	(a)	☐	☐
12. Storage: (2)			
Left in treating chamber or sanitizing solution until used, or stored properly above floor	(a)	☐	☐
Stored to assure complete drainage, where applicable	(b)	☐	☐
Single-service articles properly stored	(c)	☐	☐
13. Handling: (2)			
Sanitized milk contact surfaces not exposed to contamination	(a)	☐	☐
MILKING			
14. Flanks, Udders, and Teats: (3)			
Milking done in barn, stable, or parlor	(a)	☐	☐

		YES	NO
MILKING—Continued			
Brushing completed before milking begun	(b)	☐	☐
Flanks, bellies, udders, and tails of cows clean at time of milking; clipped when required	(c)	☐	☐
Udders and teats treated with sanitizing solution and dried, just prior to milking	(d)	☐	☐
No wet hand milking	(e)	☐	☐
15. Surcingles, Milk and Anti-Kickers: (1)			
Clean; stored above floor in clean place	(a)	☐	☐
Stools, easily cleanable construction and not padded	(b)	☐	☐
16. Transfer and Protection of Milk: (2)			
Immediate removal to milkhouse or room	(a)	☐	☐
Transfer, pouring, and/or straining facilities properly protected	(b)	☐	☐
PERSONNEL			
17. Hand-washing Facilities: (3)			
Soap, running water, and individual sanitary towels in milkroom and convenient to milking operations	(a)	☐	☐
Wash and rinse vats not used as hand-washing facilities	(b)	☐	☐
18. Personnel Cleanliness: (2)			
Hands washed clean and dried before milking, or performing milkhouse functions; rewashed when contaminated	(a)	☐	☐
Clean outer garments worn	(b)	☐	☐
19. Cooling: (5)			
Can milk cooled to 50°F. within 2 hours	(a)	☐	☐
Bulk milk cooled to 40° F. within 2 hours	(b)	☐	☐
VEHICLES			
20. Vehicles: (1)			
Vehicles clean	(a)	☐	☐
Constructed so as to protect milk	(b)	☐	☐
No contaminating substances transported	(c)	☐	☐
INSECTS AND RODENTS			
21. Insect and Rodent Control:			
Fly breeding minimized by approved manure disposal methods (3)	(a)	☐	☐
Manure packs properly maintained (3)	(b)	☐	☐
All milkhouse openings effectively screened or otherwise protected; doors tight and self-closing; screen doors open outward (2)	(c)	☐	☐
Milkhouse free of insects and rodents (2)	(d)	☐	☐
Approved pesticides; used properly (2)	(e)	☐	☐
Equipment and utensils not exposed to pesticide contamination (2)	(f)	☐	☐
Surrounding neat and clean; free of harborages and breeding areas (1)	(g)	☐	☐

Remarks:

13

Date.......................... Field Servicemen ....

Approved........... Not Approved............ Reinspect............ Exclude............

DAIRY FARM SANITATION REPORT

SCORE SYMBOLS: ✓ = YES; X = NO; – = INDETERMINABLE

HERD NUMBER
PATRON'S NAME
PATRON'S NUMBER
NO. CATTLE
NO. MILKING
POST OFFICE ADDRESS
DATE ☐ A.M. ☐ P.M.
DATE TB TEST
TOWNSHIP
COUNTY
STATE
STATUS I R RI
DATE BRUCELLOSIS TEST
BUYER
LOCATION
PREVIOUS BUYER
DATE WATER TEST
RESULTS

• Indicates major items

YES NO

COWS

1. Abnormal Milk
a. Apparently healthy, good condition
b. Diseased cattle segregated, milked last (10)
c. Proper construction, care abnormal milk handling equip.
d. Evidence strip cup or other test used (15)
e. Abnormal milk not sold

MILKING AREA

2. Construction
a. Floors, gutters, feed troughs, concrete, graded, good repair (6)
b. Walls, ceiling smooth, tight, good repair, painted biennially or whitewashed annually (8)
c. Partitioned from other livestock (10)
d. Adequate natural and artificial light, properly dist. (4)
e. Silo, feed room doors, bins tight, carts covered
•f. Stable properly ventilated (5)
g. Quarters for maternity, sick cattle
h. Walk behind cows min. 3 ft. wide (6 ft. tail to tail) exc. gutter (6)
i. No overcrowding of calves on walk (10)
3. Cleanliness
•a. No poultry, pigeons, other animals (10)
b. Walls, windows, ceilings clean (5) (8)
c. Manure removed from gutters, sides scraped (7)
•d. Stable floors cleaned, treated at least daily (22)
•e. Box stalls, pens properly maintained (22)
f. Outside pipelines clean
4. Cowyard and Loose Housing
•a. Graded, properly maintained (9)
•b. Free of swine, drainage from pig pen, milkhouse, stable (9)
•c. Manure inaccessible to cows (7)
•d. Pen stabling, loose housing, adequate, properly maint.
•e. Bedded, feeding, holding areas, acceptable const. adequate

MILKHOUSE

5. Construction and Facilities
Floors
a. Floors concrete or equally imperv., good repair, smooth (21)
b. Graded to drain, drains trapped (21)
Walls & Ceiling
a. Walls impervious at least 18 in. above floor (21)
b. Walls, ceiling, lined, smooth, painted, good repair (21)
c. Hoseport used, good repair
Lighting & Ventilation
a. Adequate natural and artificial light properly located (21)
•b. Adequate ventilation, vents (21)
Miscellaneous Requirement
•Properly located (separation comp. when req.) (21)
b. Used for dairy purpose only, equip. properly const. inst. (11) (21)
c. Milkhouse adequate size (50% working area min.) (21)
d. Proper disposal of waste (2)
Cleaning Facilities
•a. Adequate hot water available, double wash vats (A13)
b. Water piped under pressure (A13)
6. Cleanliness
•a. Floors, walls, windows, tables, non-product surface clean (17)
b. No unnecessary articles, pesticides, medicinals (21)
c. Outside of tanks, facilities, cooling water clean

TOILET AND WATER SUPPLY

7. Toilet
a. Flush .... privy .... convenient, properly located, clean
•b. Surface drainage from sewage disposal prevented (2)
•c. Privy vault tight .... lids, doors, self-closing (2)
d. Flush toilet doors self-closing
e. No evidence of human domestic waste about premises (2)
8. Water Supply
a. Drilled .... dug .... spring .... other
•b. Accessible, adequate, potable location acceptable (1)
•c. Protected from contamination (1)
d. No improper submerged inlets or cross connections

UTENSILS, TRANSFER VESSELS, LINES AND BULK TANKS

9. Construction
•a. Acceptable, installed properly, corrosion resistant, seamless good repair (11)
•b. Milking machine parts inc. rubbers, sound, good repair (11)
c. Vacuum system adequate, pulsator properly maintained (22)
d. Approved CIP milk pipeline system with vat
e. App. plastic hose, drying facilities, single service articles
10. Cleaning
a. Acceptable cleaning materials, brushes, rack (12)
•b. Utensils, equip. cleaned after each use, clean (12) vac. system clean (22)
11. Sanitization
a. Acceptable sanitizing materials
•b. Subjected to approved sanitization immed. before use (12)
12. Storage
a. Clean utensils inverted on metal rack in milkhouse (12)
b. Sufficient rust free metal racks at least 20 in. from floor (12)
c. Single service items stored in protected container (11)
d. Milker parts disassembled, except CIP, stored dry (13)
13. Handling
a. Sanitized milk contact surfaces properly protected

MILKING

14. Flanks, Udders and Teats
•a. Flanks, udders, tails clipped, clean (3)
b. Evid. proper brushing, udder wash., sanitizing facil.
15. Stools, Antikickers, and Surcingles
a. Milk stool painted, smooth wood, rust free metal (17)
•b. Clean, stored in clean place above floor (17)
16. Transfer and Protection of Milk
•a. Protected, trans'fd. promptly thru clean surround. to M.H. (16)

PERSONNEL

17. Hand Washing Facilities
a. Convenient, adequate (22)
18. Personnel Cleanliness
a. Evidence hand wash facilities used (14)
b. Milkers wear clean outer garments when milking (22)
c. No evid. of transmissable disease, open lesions
19. Cooling
•a. Facilities prov. and prop. used to cool milk to 50°F. or less (20)
b. Temperature properly maintained until delivered

VEHICLES

20. VEHICLES
a. Vehicles clean, constructed to protect milk
b. No contaminating substances transported

INSECTS AND RODENTS

21. Insect and Rodent Control
•a. Fly breeding min. by appr. manure disposal method (7) (21)
•b. Manure packs properly maintained (22)
c. All milkhouse openings effectively screened; doors, hoseport tight & self-closing; screen doors open outward (21)
•d. Milkhouse free of insects, rodents
•e. Equip. & utensils not exposed to contamination, label instructions followed
•f. Surroundings neat, clean, free of harborages, breeding areas (22)

REMARKS:

NOTICE TO PLANT
PASSING
REINSPECT
SUSPEND ______ DAYS

RECEIVED COPY
DAIRYMAN
INSPECTOR

CS 800-3 68

Sample

UPSTATE MILK COOPERATIVES, INC.
1730 DALE ROAD, BUFFALO, N. Y. 14225

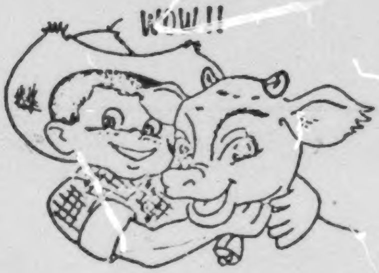
PATRONS REPORT OF QUALITY ANALYSIS

PATRON NO. ____________ SAMPLE DATE ____________

STANDARD PLATE COUNT/ML ______________________ Maximum Allowable Count 100,000/ml

SEDIMENT	ABNORMAL MILK	ANTIBIOTICS
____ GOOD ____ FAIR ____ POOR	WHITESIDE TEST NEG. TRACE 1 PLUS 2 PLUS OR GREATER SOMATIC CELL COUNT ____________ 1,500,000 Maximum Allowable Somatic Cell Count	____ NEG. ____ POS. No Tolerence

FLAVOR SCORE



☐ GOOD

☐ FAIR

☐ POOR

☐ OXIDIZED ☐ RANCID ☐ FEED-UNCLEAN ☐ BARNY OTHER ____________

0 935

SAMPLE

Producing Quality Milk

Name ______________________

Determining off flavors and their causes

Sample No.	Flavor	Possible Causes
1.		
2.		
3.		
4.		
5.		
6.		

SAMPLE

Agriculture

Name ______________________________

Date ______________________________

Test for Objective #4 of Quality Milk Production Module

For each of the following major areas of the Dairy Farm Sanitation Report, list three regulations a farmer must comply with.

A. Milking Area

1.

2.

3.

B. Milk House

1.

2.

3.

C. Utensils, Transfer Vessels, Lines and Bulk Tanks

1.

2.

3.

SAMPLE

Agriculture

Name ____________________

Date ____________________

Test for Objective #5 of Quality Milk Production Module

Correctly interpret the following milk quality test course by explaining what they represent and whether the score is good, fair or poor.

1. SEDIMENT TEST OF ____________________

2. STANDARD PLATE COUNT OF ____________________

3. MODIFIED WHITESIDE REACTION OF ____________________

4. ANTIBIOTIC TEST ____________________

Notes from presentation from Mrs. Hines Laboratory Technician Upstate Milk Cooperative, 1730 Dale Road, Buffalo, New York 14225.

1. Standard Plate Count

Measures growth of bacteria in milk. The maximum allowed is 100,000 colonies per ml. Most farmers are under 30,000.

The sample is diluted 1ml. milk and 99ml. sterile water then put on agar plate at 98 degrees for 48 hours. Then the colonies of bacteria are counted.

   1. Streptococci - poor cooling
   2. Staphylococci - contaminated utensils
   3. Streptococcus agalactiae - mastitis

2. Abnormal Milk (Modified Whiteside Reaction)

A count of white blood cells indicating cow's health or mastitis. Milk is mixed with NaOH and stirred then compared to photo available from G. Hadley Smith, Carey Building, Ithaca. It is scored as negative, trace, 1+, 2+, 3+. One plus is the cutoff.

3. Antibiotic Test

A sterile disc is dipped in milk and put on a bacteria plate. If antibiotic is present, a ring appears due to death of bacteria culture. Test is positive or negative. If positive, milk is withheld for four milkings as penalty.

4. Sediment Test

Measures sediment as mg. per pint. One pint of milk is forced through a .4" disc. Rejection point is 1.5 mg. per pint. Scores are 0, 1, 2, 3, 4, 5.

Recorded by

Gary Barton
Spring 1971

MILK FLAVOR DEFECTS

THEIR CAUSES AND PREVENTION

Flavor Defects	Causes	Prevention
Feed	Pasture	Remove from pasture 4 hours before milking.
	Silage	Keep cows away from silage for 4 hours before milking.
	Thawing or storing silage in stable	Avoid this practice. Ventilate.
Barny and/or Cowy	Dirty stables	Clean stables.
	Dirty cows	Clean cows.
	Damp stables Poor ventilation	Proper ventilation.
Salty	Mastitis	Healthy cows properly milked.
	Stripper cows	Discard milk from cows being dried off.
Rancid	Stripper cows	Discard milk from cows being dried off.
	Poor cooling	Cool quickly and keep cold.
	Foaming	Reduce foaming.
	Agitation	Agitate as little as possible.
Malty	Mastitis	Healthy cows properly milked.
	Dirty utensils, including stanchion hoses	Clean, sanitized utensils and stanchion hoses.
	Poor cooling	Cool quickly and keep cold.
	High bacteria	Eliminate milkstone.
High acid	High bacteria	Eliminate milkstone.
	Dirty utensils	Clean and sanitize.
	Poor cooling	Cool quickly and keep cold.
Oxidized	Exposed copper, bronze, or brass in milker parts	Replace with stainless steel.
	Exposed iron or rust in pails, cans, strainers	Retin or replace.
	Daylight	Keep covered.
Unnatural	Medication of teats	Use colorless petroleum jelly.
	Disinfectant	Use odorless disinfectants.
	Some fly sprays	Use sprays with little or no odor.
	Dirty mangers	Sweep twice daily.
		Prevent water bowl leakage.
	Moldy feed	Feed after milking.
	Sick cows	Discard milk.

AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF VERMONT

Cooperative Extension Work in Agriculture and Home Economics, State of Vermont. College of Agriculture and Home Economics, University of Vermont, and United States Department of Agriculture Cooperating. R. P. Davison, Director, Burlington, Vermont (Acts of May 8 and June 30, 1914). Q127 2-59 10M QCP

MODULE OF INSTRUCTION

Title - DAIRY CATTLE BREEDING

Code - 01.01010101-02

DESCRIPTION:

Developing a dairy herd breeding program - The student will acquire knowledge of inheritance, reproduction and study the available methods of breeding dairy cattle in his or her community. The student will plan and develop an efficient breeding program for a dairy herd including determining the breeding time, animal identification, breeding difficulties and record keeping.

The student will visit local farms and the headquarters of an artificial insemination unit.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Fundamentals of Genetics	4	0
2. Physiology of Reproduction	4	2
3. Establishing Proper Time of Breeding	3	0
4. Methods of Breeding	1	0
5. Breeding Difficulties	2	2
6. Establishing Working Relationships with Veterinarians & Inseminators	1	0
7. Keeping Individual Cow Records	2	2
8. Interpreting A.I. Sire Reports	3	0
9. Determining A Breeding Program	0	4
	20	10

Revised June, 1974

MODULE OF INSTRUCTION

Title - DAIRY CATTLE BREEDING

Code - 01.01010101-02

OBJECTIVES to be obtained:

The student will be able to:

1. Demonstrate knowledge of basic genetics by describing the inheritance of production and other inherited characteristics.
2. Describe and give examples of the four systems of breeding cattle.
3. Identify and explain the functions of the reproductive parts of the male and female dairy animal.
4. Demonstrate the ability to detect heat periods in dairy cows and establish the optimum time for breeding by describing the signs of heat.
5. Describe the merits of natural service and A.I. service. Students will become familiar with A.I. techniques involved in breeding dairy animals.
6. Identify irregularities causing breeding difficulties.
7. Become familiar with services of the veterinarian and inseminator.
8. Demonstrate the ability to keep individual cow breeding records, record and analyze the information.
9. Interpret the reports and ratings of the A.I. and breed association sire evaluation programs.
10. From the information received in this module develop a breeding program that will improve a herd's production and longevity.

Code - 01.01010101-02

Title - DAIRY CATTLE BREEDING

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Fundamentals of Genetics Objective #1 Demonstrate knowledge of basic genetics by describing the inheritance of production and other inherited characteristics.	A. Basic Genetics B. Laws of inheritance . Sex determination . Sex-link characters . Dominant & recessive characteristics . Undesirable recessives . Lethal genes . Mutations C. Inheritance of Production D. Inheritance factors that influence type
Objective #2 Describe and give examples of the four systems of breeding cattle.	A. Systems of breeding cattle . Line breeding . In breeding . Out crossing . Cross breeding
Unit 2 - Physiology of Reproduction Objective #3 Identify and explain the functions of the reproductive parts of the male and female dairy animal.	A. Physiology . Male organs . Female organs . Conception . Twinning . Process of birth . Hormone action as related to the reproduction tract

Unit 3 - Establishing Proper Time of Breeding
Objective #4
Demonstrate the ability to detect heat periods in dairy cows and establish the optimum time for breeding by describing the signs of heat.
	A. Establishing Breeding Time
	. Length of time after parturition
	. Estimated conception pattern
	. Length of time required for reproductive organs to return to normal
	. Estimated optimum calving interval
	. Heat detection program
	  . signs of heat
	  . observation of cows
	  . daily exercise schedule
	. Proper time during heat period to breed
	. Length of heat period

EDUCATION

01.01010101-02 - Code

DAIRY CATTLE BREEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion to present facts. Genetics and livestock breeding transparencies, Cal. Tech. & Cornell IMS. Films-Cornell Film Library, others. Inheritance Problem Work Sheets. Ref. Dairy Cattle Sterility-Hoard's. Holstein Assn. Sheet on undesirable recessives. B. Field trip to visit area farm where laws of inheritance can be studied. C. Color pattern of cattle. Undesirable recessives.	A. Take notes on new information. B. Study references C. Compile list of known undesirable recessives in own herd. D. Field trip notes. E. Problem solving techniques on inheritance problems. F. Students will give reasons for placing cows in live judging contest using appropriate terms.	A. Written test using genetics problems. B. Evaluate student notes and problem solving. C. Students will list six dairy characteristics that could be improved by corrective breeding.
A. Field trip to area farms to observe method of breeding cattle. B. Lecture - discuss C. Assign questions from text books on breeding systems.	A. Students describe method of breeding cattle used on cows in his supervised experience program.	A. Written test - . Match-up on breeding systems and descriptions.
A. Diagrams & Functions - Transparencies-Cornell IMS Sterility in dairy cattle-Hoards B. Veterinarian-demonstration of parts & functions of an actual male & female reproductive tract obtained from local butcher. C. Film-Reproduction of Farm Animals - Cornell Film Library Colored Slides -"The Developing Fetus" Cornell IMS	A. Label diagram & list functions of male and female reproductive tracts from references. B. Observe carefully the veterinarian as he dissects and explains functions of reproductive tracts.	A. Written test on labeling reproductive tracts and function of parts.
A. Lecture - Discussion Eastern A. I. Charts B. Colored Slides-"Signs of Heat in the Dairy Cows" Cornell IMS C. Slides -"The Recovery of the Uterus after Calving"-Cornell IMS D. Use Hoards Dairy Sterility Unit & film strips on sterility & reproduction - American Breeder filmstrips-Dairy Production	A. Note taking - draw a time interval chart for breeding dairy cows. B. Students may work with the home farm or cooperative farm herd in determining the proper time for breeding cows. A record could be maintained by the student indicating his observations and recommendations. The teacher can check these records during a supervised work experience visit.	A. Written exam on time of breeding and signs of heat in the dairy cow.

Code - 01.01010101-02

Title - DAIRY CATTLE BREEDING

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Methods of Breeding Objective #5 Describe the merits of natural service and A. I. service. Students will become familiar with A. I. techniques involved in breeding dairy animals.	A. Methods B. Natural Service - . Natural breeding facilities . Handling of animals . Proving a herd sire . Production . Type . Sales Appeal C. Artificial Insemination . Techniques of breeding A. I. . Freezing of semen . Storage facilities . A. I. Services
Unit 5 - Breeding Difficulties Objective #6 Identify irregularities causing breeding difficulties.	A. Breeding irregularities . Abnormal heat cycles and periods . Cystic ovaries . Abnormal discharges . Genital disease . Hormonal disturbances . Nutritional deficiencies . Anatomical defects
Unit 6 - Establishing Working Relationships with Veterinarians & Inseminators Objective #7 Become familiar with services of the veterinarian and inseminator.	A. Working Relations . What the dairyman should expect from the technician . What the technician should expect from the dairyman . Pregnancy examinations by veterinarian . Treating abnormalities by the veterinarian

EDUCATION

01.01010101-02 - Code

DAIRY CATTLE BREEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trip to breeder who has successfully merchandized a herd sire. Observe facilities. B. Field trip to an A. I. stud Observe handling of sires Drawing of sires Freezing & storage labs D. Speaker-local district A.I. personnel.	A. Note taking on field trips. B. Travel with local inseminator. C. Panel discussion: . Use of a herd sire vs A.I. for my herd.	A. Orally describe the techniques of A. I. and the merits of A. I. Breeding and the use of natural service. B. Written examination on unit 4 factual information.
A. Lecture - Discussion B. Speaker - Veterinarian or tape recording of veterinarian. C. Field trip - local farm to study breeding history of the herd. D. Supervised study E. Sterility in Dairy Cattle - Hoard's	A. Obtain breeding records and conception % of own herd, employer's herd, or neighbor's herd. Study records and evaluate results. B. Travel with a veterinarian to a problem herd. Observe how the veterinarian handles specific problems.	A. Written exam on breeding irregularities. B. Student report on field trip with a veterinarian.
A. Tape recording of local A. I. technician and veterinarian on working relationships with the farmer. B. Invite resource people to class for a discussion on veterinarian and A. I. inseminator services.	A. Working relations can be discussed as you travel with the veterinarian or local A.I. technician.	A. Teacher recognition of student travel with veterinarian and/or inseminator. B. Oral reports by students regarding the information given by resource people.

Code - 01.01010101-02

AGRICULTURAL

Title - DAIRY CATTLE BREEDING

OBJECTIVES BY UNIT	CONTENT
Unit 7 - Keeping Individual Cow Records Objective #8 Demonstrate the ability to keep individual cow breeding records, record and analyze the information.	A. Breeding Records B. Identification C. Reproduction - . Calving date . Sires used . Sex . Disposition of calves . Earliest breeding date . Heat periods . Breeding dates . Service information . Pregnancy examination . Veterinary treatment . Due to calve date . Drying out date D. Plot cow families E. Write pedigrees
Unit 8 - Interpreting A. I. Sire Reports Objective #9 Interpret the reports and ratings of the A. I. and breed association sire evaluation programs.	A. A. I. Sire Summaries . Production level . Type evaluation . Method of determination B. Breed Association Sire Performance Summaries ..Production . Type . Repeatability . Mature equivalent
Unit 9 - Determining a Breeding Program Objective #10 From the information received in this module develop a breeding program that will improve a herd's production and longevity.	A. Breeding Program Considerations B. Laws of inheritance C. Factors to consider in mating . Increasing production . Correcting type weaknesses . Size . Color . Cost

E D U C A T I O N

01.01010101-02 - Code

DAIRY CATTLE BREEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Display actual breeding records for observation - different charts. B. Interpretation of DHIC informational sheets on breeding data. C. Note taking on breeding records to keep. D. Display pedigree forms E. Display cow family charts F. Supply students with sample copies of completed pedigree forms.	A. Students select a breeding chart and actually keep breeding records on cows in their supervised experience program. B. Students write up pedigrees and plot cow families of cows in his supervised experience program. C. Student discussion of sample pedigrees and cow family charts.	A. Teacher evaluation of breeding charts kept by students. B. Teacher evaluation of pedigrees and cow family charts.
A. Supervised interpretation of sire summaries of individual sires. B. Extension Service A.I. Sire Summary listings Work sheets on mature equivalent Sire selection committee Resource people representing the major breeds in the area	A. Rate a group of sires based on information from sire summary reports. B. Participate in a herd classification activity observing an official breed classifier.	A. Teacher evaluation of sire ratings.
A. Supervised study of considerations in a breeding program. B Review notes C. Speaker - successful breeder of dairy cattle in the community; D. Field trip to a farm that has done a fine job in improving his herds production and type by selective breeding.	A. Attend a breeders institute meeting in your area. Nationally known speakers. B. Determine a breeding program to fit your needs listing specific matings and justify each mating.	A. Teacher evaluation of student's breeding program. B. Oral examination questions by the instructor on unit 9 content. C. Given appropriate references and available sires the student will analyze the information and select the sires most desirable for improving identified weaknesses in specific females.

MODULE OF INSTRUCTION

Title - DAIRY CATTLE BREEDING Code - 01.01010101-02

RESOURCE MATERIALS

Books:

Anatomy & Physiology of Farm Animals - Frandson - Lea & Febiger
Reproduction in Farm Animals - Hafez - Lea & Febiger
Principles of Genetics - Gardner - Wiley
Cattle Fertility & Sterility - Asdell - Little & Brown
Breeding & Improvement of Farm Animals, 6th ed, Rice - McGraw-Hill
Artificial Insemination of Farm Animals, Perry - Rutgers
Sterility in Dairy Cattle-Hoard's Dairyman.

Bulletins:

Artificial Insemination of Livestock - Illinois, available IMS
Sterility & Delayed Breeding of Dairy Cattle - Cornell E737
Selection & Evaluation of Dairy Sires, E1118
Estimating Transmitting Ability of Sires, Cornell 1217
Reproduction of Farm Animals - Cornell (out of print)

Periodicals:

Artificial Insemination (monthly) - Nat. Assn. of Animal Breeders
Eastern A. I. Cooperator - Eastern A. I. Coop.
All Breed Assn. Magazines
Hoard's Dairyman

Audiovisuals:

Dairy Visuals, 16 masters, available from IMS
Dairy Cattle Sterility (45 slides) Cornell IMS
Recovery of the Uterus After Calving - IMS
Signs of Heat in Dairy Cattle - Slides - IMS
The Developing Fetus - Slides - IMS

MODULE OF INSTRUCTION

Title - FEEDING DAIRY CATTLE

Code - 01.01010101-03

DESCRIPTION:

The conversion of feeds into milk at the lowest cost possible is a basic challenge to dairymen. Proper selection of high quality economical feeds is essential for profitable milk production. The farmer is continually feeding animals that do not yet produce to their inherited genetic base during their productive years. The farmer must select feeds and plan his feeding program to produce milk at the most economical cost possible in his area.

Students involved with this module will develop the skills required in selecting feeds to meet the nutritional needs of calves, dry cows, and cattle in production. Emphasis will be placed on a good feeding program for calves, nutritional values of feeds, and the requirements for growth, production, reproduction and maintenance of the herd.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Digestive tract and the digestive process	1	2
2. Feeds available	1	8
3. Nutritional needs of springing heifers and dry cows	1	3
4. Nutritional needs of the milking herd		4
5. Feeding practices	2	8
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - FEEDING DAIRY CATTLE Code - 01.01010101-03

OBJECTIVES to be obtained:

The student will be able to:

1. List the parts of the digestive tract and the functions of each part in the digestive process.

2. List the forage crops which are the most economical to grow in the area and note their nutritional values and production costs.

3. List the crops classified as concentrates which are the most economical to grow in the area and list their nutritional values.

4. List the By-Product Feeds available in the area. Know from what process they are produced, their identification, nutritive value and cost.

5. List the feeds that are available in your area (both forage, and supplements) discuss their nutritional values.

6. Calculate the nutritional needs for springing dairy heifers and dry cows (allowing for pregnancy).

7. Calculate the nutritional needs for -- given examples of -- milking cows in the three different categories of production listed: (1) production maintenance and growth, (2) production, maintenance and pregnancy, (3) production and maintenance only.

8. List five ways for providing mineral supplements for dairy cattle.

9. Balance, to the instructor's satisfaction, a ration for a given situation concerning dry cow, three years old.

10. Balance, to the instructor's satisfaction, a ration for a given situation concerning a milking cow carrying a calf for five months.

11. List the advantages of complete feeds in feeding dairy cattle.

01.01010101-03

Title - FEEDING DAIRY CATTLE

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Digestive tract and the digestive process Objective #1 The student will be able to list the parts of the digestive tract and the functions of each part in the digestive process.	A. The Digestive Tract . Mouth . Esophagus . Reticulum . Rumen . Omasum . Abomasum . Small Intestine . Large Intestine B. Functions . Mastication . Regurgitation . Rumenation . Digestion
Unit 2 - Feeds available for dairy cattle Objective #2 List the forage crops which are the most economical to grow in the area and note their nutritional values and production costs.	A. Forages . Hay . Alfalfa . Birdsfoot trefoil . Medium red clover . Timothy . Sudumgrass, Millet . Others and mixtures B. Silage . Haylage . Corn Silage . Sorghum
Objective #3 List the crops classified as concentrates which are the most economical to grow in the area and list their nutritional values.	A. Grains . Corn . Oats . Wheat . High moisture corn . Rye . Barley

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study from references . Labeling the parts of the digestive tract . Feeds and Feeding . Feed Company Booklets B. List the functions of each part C. Film - "The Rumen Story" Ralston-Purina Co. Cornell Film Library	A. From a mimeo of the digestive tract student will label parts and list the functions of each part in the spaces provided.	A. Written test on labeling parts of digestive tract B. Written test on match-up on functions of digestive tract.
A. Supervised study Ref. . Feeds and Feeding . Feed Company Bulletins . Local farmers B. Discussion (class) C. Field trips to local feed mills and feed dealers	A. Compile a list of forages raised in the area. B. Chart the values of each forage for D.P., T.D.N., and net energy, and cost. Relate date of harvest to feeding value. C. Discuss each crop in class noting reasons for using it or not using it.	A. Instructor's evaluation of the list and charted values.
A. Supervised study Ref. . Feeds and Feeding . Cornell Recommends . Local farmers . Feed Co. Bulletins . Feed and Feeding B. Discussion group study samples of concentrates or identification C. Invite feed store management to visit classroom and discuss concentrates, rations and current prices. D. Field trips to feed mills and local feed dealers.	A. Compile a list of grains raised in the area. B. Chart the values of each grain for D.P., T.D.N., and cost. C. Figure costs on 100 lbs TDN Bases. D. Identify plates of cereal grains. E. Panel discussion of value of raising corn and oats . One group supports the crop, while the other resists it. F. Have students visit feed companies to collect ingredient samples and feed tags.	A. Instructor's evaluation of list and charted values. B. Quiz on identification of feeds and grains. C. Instructors make up a quiz using ingredient and concentrates used in formulating feeds. D. Test to determine if students could identify ingredients and concentrates.

Title - FEEDING DAIRY CATTLE

OBJECTIVES BY UNIT	CONTENT
Objective #4 List the By-Product Feeds available in the area. Know from what process they are produced, their identification, and describe nutritive values and cost of the by-products.	A. By-Product Grains: . Brewers Grain . Distillers Grain . Hominy . Wheatgerm meal . Soybean oil meal . Linseed oil meal . Cottonseed oil meal . Beet pulp . Citrus pulp . Others
Objective #5 List the feeds that are available in your area (both forage and supplements); discuss their nutritional values and costs.	A. Roughages . Hay . Corn silage . Haylage B. Supplements . Corn . Oats . Wheat . By-Products Concentrates C. Factors to consider . Quality . Cost . Availability
Unit 3 - Nutritional needs of springing heifers and dry cows Objective #6 Calculate the nutritional needs for springing heifers and dry cows (allowing for pregnancy).	A. Feeding the dairy heifer . Estimating the weights of dairy heifers . Feeding schedule for dairy heifer B. Winter feeding hay, silage and concentrates C. Feeding heifers on pasture D. Water and minerals E. Preparation for freshening factors - . Body (maintenance) . Pregnancy . Growth

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study Ref. . Feeds and Feeding . Feed Co. Publications B. Obtain by-products and concentrates from local feed outlet for identification.	A. Chart the values of each by-product for D.P., T.D.N., Net Energy and cost. B. Figure the cost of each on 100 lbs and ton bases C. Identify samples of by-product concentrates.	Written test: A. Match-up questions on by-product grains B. Identification of by-product grains C. Problem on cost of a concentrate figuring 100 lbs and ton bases.
A. Supervised study B. Panel Discussion C. To buy or not to buy hay and silage D. Local feed store manager discuss in class the availability of concentrates and mechanics involved in costs. E. Feed Co. Fieldman discuss in class supplement feeds and new materials, such as liquid protein.	A. Compile a list of available feeds B. Prepare a discussion (5 people support buying hay and silage and 5 people support raising hay and silage).	A. Written or oral test B. List feeds available to be purchased and their costs.
A. Lecture B. Class Discussion C. Supervised study - . Feeds and Feeding Abridged . Raising dairy calves and heifers (Bulletin) . Animal Science . Magazine articles D. Field trip to dairy farms	A. Note taking B. Discussion of needs C. Calculate and record the nutritional needs as stated in Feeds and Feeding, Table III for the given heifer and dry cow.	A. Teacher evaluation B. Prepare a written examination using multiple choice questions and essay questions.

Title - FEEDING DAIRY CATTLE

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Nutritional needs of the milking herd Objective #7 Calculate the nutritional needs for given examples of milking cows in three different categories of production listed (1) production maintenance and growth (2) production, maintenance and pregnancy, (3) production and maintenance only.	A. Factors - . Body weight maintenance . Pregnancy . Production . Growth
Unit 5 - Feeding practices Objective #8 List five ways for providing mineral supplements for dairy cattle. How can minerals be fed?	A. Ways of providing minerals for dairy cattle . Dry lot . Pasture . Full hay . Full silage B. How can minerals be fed? . Block . Granular . Liquid . Mixed with feed or free choice
Objective #9 Balance, to the instructor's satisfaction, a ration for a given situation concerning dry cow, three years old.	A. Types of feed . Roughage . Concentrates . Mineral supplement B. Factors to consider - . Body maintenance . Pregnancy . Production

EDUCATION

01.01010101-03 - Code

FEEDING DAIRY CATTLE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study . Reference - Feeds and Feeding . Guest speaker - Cooperative Extension Specialist B. Topic - Computerized calculations of feed formulation . Feed Company, Dairy Specialists, guest speakers, student panel consisting of students with dairy enterprises on the home farm and cooperative farms.	A. Calculate and record the nutritional needs of the cattle giving - . Example; use feeds and feeding Table III Questions and answers and discussion	A. Teacher evaluation of calculations by students B. Problem solving quiz
A. Field trip to dairy farm B. Field trip to feed store C. Supervised study	A. Compile and file the list of methods for supplying minerals and choose the one which most meets the students needs. B. Construction of a pasture mineral feeding container.	A. Oral or written test B. Teacher observation
A. Supervised study B. Feeds and Feeding Table III and Table I	A. Find the needs of the animal B. Meet her needs through feeding basically roughage and supplement this with concentrates. Use an actual project animal or home farm or employer's animal when possible.	A. Instructor's evaluation of calculated material.

Title - FEEDING DAIRY CATTLE

OBJECTIVES BY UNIT	CONTENT
Objective #10 Balance, to the instructor's satisfaction, a ration for a given situation concerning a milking cow carrying a calf for five months.	A. Types of feed - . Roughage . Concentrates . Mineral supplement B. Factors to consider - . Body maintenance . Production . Pregnancy
Objective #11 List the advantages of complete feeds in feeding dairy cattle.	A. What are complete feeds? . Roughages . Concentrates B. How can complete feeds be used in dairy feeding programs? C. Advantages of complete feeding programs

01.01010101-03 - Code

FEEDING DAIRY CATTLE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study - Reference Feeds and Feeding Tables I and III	A. Find the needs of the animal B. Meet her needs through feeding basically roughage and supplement this with concentrates. C. Calculate for an actual project animal on home farm or employer's animal when possible. D. Analyze a tag from a bag of Dairy Ration.	A. Instructor's evaluation of calculated material.
A. Classroom discussion B. Students take notes C. Invite farmers that are using the complete feed concept.	A. Apply the complete feeding concept on the home farm.	A. Written test on subject matter.

MODULE OF INSTRUCTION

Title - FEEDING DAIRY CATTLE Code - 01.01010101-03

RESOURCE MATERIALS

Books: Feeds and Feeding Abridged, Morrison, Morrison Publishing Co.
Animal Science

Bulletins:
1. Cornell Recommends, Cornell, IMS. Stone Hall
2. Raising Dairy Calves and Heifers, Cornell Ext. 76
3. Feed companies prepare bulletins which may be procured from local feed dealers.
4. Feeding Dairy Cattle, Cornell

Periodicals:
Farm Journal
Successful Farming
Hoards Dairyman
Pennsylvania Farmer

Audiovisuals: "Rumen Story" 1. Ralston-Purina Co.
or St. Louis, Mo.
2. Cornell Film Library
Feed Company Fieldmen
Extension Service Specialist - Dairy Production

MODULE OF INSTRUCTION

Title - Dairy Health and Disease Code - 01.01010101-04

DESCRIPTION:

This module will prepare the student to set up a herd health and disease prevention program that will be satisfactory for a dairy herd. Emphasis is placed on the diagonosis and treatment of animals for specific conditions and diseases under direction and supervision of veterinarians. Sanitation and environmental controls will be examined and the necessary health records will be mantained. Students will also become familiar with state and federal regulations that pertain to sales of cattle and shipment of milk during treatment period.

DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Importance of Disease Control	2	0
2. Herd Health Problems	8	10
3. Management for Disease Prevention	4	6
	14	16

Revised January '75

MODULE OF INSTRUCTION

Title - DAIRY HEALTH AND DISEASES

Code - 01.01010101-04

Objectives to be obtained:

The student will be able to:

1. Define and show the economic importance of good herd health. Contrast the definition with that of disease, stress, condition.

2. Select and use reference materials on animal health conditions for identification of causal agents and means of spreading diseases.

3. Demonstrate to the instructor's satisfaction a knowledge of the 16 general symptoms, any one of which is an indicator that an animal is not in good health.

4. Demonstrate to the instructor's satisfaction a working knowledge of the causes, symptoms, treatment, control or prevention measures of 25 dairy cattle diseases, conditions or stresses by the instructor and of economic importance in our state or area.

5. Determine when a veterinarian should be called to treat dairy cattle and those services that go along with veterinarians services.

6. List 10 important sanitation and environmental control measures used for control or prevention of disease, condition or stress.

7. Demonstrate how to correctly prepare, use and analyze either the DHI health record or individual permanent record to prevent disease problems.

8. List procedures required to care for a sick or injured animal.

9. Plan a farm medicine chest. List minimum equipment and contents that should be kept on hand for dairy herd health use.

10. Name the state and federal regulation requirements for marketing milk and dairy animals.

Code - 01.01010101-04

Title - DAIRY HEALTH AND DISEASE

OBJECTIVES BY UNIT	**CONTENT**
Unit 1 Importance of Disease Control Objective 1 Define and show the economic importance of good herd health. Contrast the definition with that of disease, stress, condition.	A. Definition of good health as contrasted with disease, stress, condition. B. Definition's development for: . Disease . Condition . Stress C. Losses in income: . Production of milk . Animal losses D. Costs: . Direct costs . drugs . veterinarian . other Indirect . loss in milk not produced . loss in feed conversion . affect on food supply
Objective 2 Select and use reference materials on animal health conditions for identification of causal agents and means of spreading disease.	A. Listing of available references on cattle disease . Texts . Periodicals . Slides . Tapes B. Identification of causal organism for disease: . Bacteria . Virus . Fungi . Paracites . Protozoa . Spores . Poisons . Feeds . Chemicals C. Identification of means of disease spread . Direct contact . Indirect contact

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Lecture-discussion-use of charts showing the costs related to disease control from direct and indirect reasons. C. Tape interview of veterinarian and/or local farmers in discussion of losses. Directed study-Bull. 998-pgs 3-5 D. Examination of DHI monthly records of selected individual animals in herds to demonstrate losses in production as result of disease or condition as compared to animals free of disease or condition. E. Examination of farm cash accounts from sample farm for expense of veterinarian services and drugs. F. Establishment of an average cost per cow for veterinarian and drugs from Farm Business Studies.	A. Written definitions of good health. Disease-stress-condition B. Student become aware of the economic problem-and include in the written notes or written work sheet C. Student examination of their own herd situations if on DHI. D. Student examination of farm cash account records to determine expense for veterinarian services and drugs. E. Comparison of home conditions to state or regional Farm Business Studies. A.C. Use small beads or marbles to take 10% of the crop each year for a 5 year period. The pile you accumulate due to disease will show the influence of disease on food supply.	A. Oral or written expression for each-health, disease, stress condition in students own words. B. Written evaluation of present conditions on home farms/or written test.
A. Lecture-Discussion-supervised study for general causes of health problems of livestock, and the environmental conditions that are conducive to the spread of disease within a herd or area.	A. Students will find available references and develop a list of disease references for class use. B. Students prepare lists of agents that cause disease and the methods by which a disease can be spread.	A. Continous evaluation during module to determine how frequently and with what competence B. Students use references. Oral or written quiz.

Code - 01.01010101-04

Title - DAIRY HEALTH AND DISEASE

OBJECTIVES BY UNIT	CONTENT
Unit 2 Herd Health Problems Objective 3 Demonstrate to the instructor's satisfaction a knowledge of 16 general symptoms, any one of which is an indicator that an animal is not in good health.	A. General symptoms . Appetite change . Cessation of rumination . Roughened hair coat . Loss of hair . Dull eye . Loss of weight or condition . Coughing & nasal discharge . Rise in body temperature . Skin changes . Respiration rate . Abnormal gait . Muscular tremors . Consistency of manures . Drop in milk production . Abnormal milk . Discharge from bowel or reproductive tract . Pulse rate . Urine
Objective 4 Demonstrate to the instructor's satisfaction a working knowledge of the causes, symptoms, treatment, control or prevention measures of 25 dairy cattle diseases, conditions or stresses selected by the instructor of economic importance in our state or area.	A. Infectious diseases . Mastitis . Brucillosis . Trichomoniasis . Leptospirosis . Foot rot . Metrites . Cow pox . Vibriosis . Rabies . Anthrox . Black leg . Shipping fever . Pink eye . Lumpy jaw . Winter dysentary . Warts . Ringworm . Tuberculosis B. Metabolic conditions . Bloat . Ketosis . Edema . Milk fever . Retained fetal membrane . Hardware . Vitamin deficiencies . Teat spider C. Parasites . Flies . Lice . Grubs . Mange D. Poisons . Nitrate . Prussic acid E. Mechanical injury . Smashed teat . Capped hip . Broken bones . Wounds

01.01010101-04 - Code

DIARY HEALTH AND DISEASE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion of when to call a veterinarian. B. Group discussion regarding what farmers and students should be able to treat. C. Tape or actual interview with area veterinarian. . Discussion of his role in herd health . Information needed both at the time of call and when at the farm . His evaluation of when individual should make his own treatments D. Role playing using practice telephone for leaving message for veterinarian.	A. Supervised study B. Individual evaluation in diagnosis of animals symptons C. Role playing-practice making call to veterinarian office leaving information	A. Written test B. Continued diagnosis as in Objective #4

OBJECTIVES BY UNIT	CONTENT
Objective 5 Determination when a veterinarian should be called to treat dairy cattle and those services that go along with veterinarians services.	A. Determining the value of animals in terms of cost required for treatment . Diagonosis of condition . Skills in administration medication . Equipment available . Desire of individual to do work B. Determination of degree of sickness . Pulse . Temperature . Alertness . Respiration . Other symptoms C. Information given at time of call . Who is calling . Address or location . Reason for call: . symptoms . when noticed . what done so far D. Veterinarian service at the farm . Information available on animal . Assistance for veterinarian . Treatment to follow . Record treatment data

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion of general symptoms that effect animals which indicate something is wrong.	A. Demonstrate ability to take temperature, pulse, & respiration rate through actual examination.	A. Written test of listing the general symptoms.
B. Ditto list of symptoms and what to look for.	B. Note taking of general symptom list.	B. Demonstrate to instructor's satisfaction ability to accurately check- . Temperature . Pulse rate . Respiration rate
C. Slides or pictures showing animals with various symptoms.	C. Students can visit livestock auctions and report on the visual appearance of cattle and calves.	C. Slide test of animals showing symptoms. Have students list symptoms shown in the slides.
D. Identification of the normal condition for these to include demonstrations for taking temperature, respiration, pulse.	D. Students keep notebooks containing diseases, including causes, symptoms, treatment, controls, prevention. Include any updated statistics that relate to current economic losses.	D. Student notebook evaluated for content on each of the diseases and/or conditions. Written test where at least 80% accuracy is required for disease causes, symptoms, treatment, controls, and prevention.
E. Field trip to farm for animal examination and demonstrations. Use local veterinarians as resource people.		
F. Supervised study and group discussion using references. Preparation of sheets for diseases and/or conditions.		
G. Slides and tapes of specific diseases		

Code - 01.01010101-04

Title - DAIRY HEALTH AND DISEASE

OBJECTIVES BY UNIT	CONTENT
Unit 3 **Management for Disease Prevention** Objective 6 List 10 important sanitation and environmental control measures used for control or prevention of disease, condition or stress.	A. Proper sanitation measurers to control dairy diseases. B. The list should contain items in the following general areas: . Proper feeding. . Sanitation in buildings, yards, lanes, pastures . Proper equipment in good working order . Well maintained fences, yards and exercise area . Ventilation of buildings . Stall sizes . Pens availability and size . Isolation of sick or new animals . Manure disposal . Federal & state disease control regulations
Objective 7 Demonstrate how to correctly prepare, use and analyze either the DHI health record or similar record for animal health.	A. Information needed in health record . From birth or when entered the herd if purchased replacements . Identify . Dates of disease-condition . Treatment used . Keep records current B. Use and analysis of the health record . Past condition that may repeat . Frequency of a condition as mastitis or milk fever or bloat . Breeding history particularly estrous periods C. Temporary and permanent records . Barn type sheets . Permanent cards and/or records. . Wheel-type of breeding record

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DAIRY HEALTH AND DISEASE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion after study period. B. Slides showing desired environment C. Tape interview with veterinarian in regard to sanitation and environmental factors D. Field trips to farms (prefer two situations, one farm in 40-60 cow range and the other a large operation in the 150-200 cow range) for comparison of operations. Develop score card of "yes"-"no" conditions of sanitation and environmental factors similar to "Barn Score Card" used by milk company.	A. Students prepare list of sanitary and environmental control measures desired for farm. Students score farms as to "yes" or "no" of their developed list.	A. Written test B. Evaluate their own situation on selected one and compare score card result to that of instructor.
A. Lecture demonstration of methods used in keeping of health records both for DHI and for other types of health record forms or cards (see appendix) B. Student problem solving situations, keeping records and evaluation of situations in terms of planning for coming year C. Field trips to farms where systematic records of health and/or breeding are maintained.	A. Students practice filling out records on animals using DHI forms and other types of health records. B. Students analysis of problem situations amd prepare plans to prevent problems from getting established.	A. Given situations to teacher's satisfaction that student can maintain, use, and analyze. B. Given sample DHI health records students will evaluate the records indicating strengths and weaknesses of animals.

Title - DAIRY HEALTH AND DISEASE

OBJECTIVES BY UNIT	CONTENT
Objective 8 List procedures required to care for sick or injured animals.	A. Basic diagnosis . Temperature . Pulse . Respiration B. Getting animal isolated . Leading C. Management . Blanketing . Feeding & watering D. Administering antibiotics . Drenching . "bougies" . Shots . Balling gun E. Other skills associated with treatment . Casting . Bandages . Restraining . Block & tackle or jacks . Handling feet . Use of electric prods . Trocar & cannula F. Safety in handling animals . Personal . Animal involved

EDUCATION

01.01010101-04 - Code

DAIRY HEALTH AND DISEASE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration by veterinarian recommended where teacher does not have experience (Under no circumstances should teacher undertake treatment of an animal unless he is absolutely sure of his ability). B. Field trip to farm where demonstrations and practice may be carried out where facilities exist for proper handling of animals. C. Supervised study using references in regard to basic diagnosis, isolating animals, management, treatment and handling animals.	A. Observation of demonstrations in some cases students may be allowed to practice handling the animals as restraining, feet work and locating where shots would be administered. B. Observe veterinarians work on farm cattle.	A. Written test B. Notes taken for completeness. C. Evaluation of student practice in handling of animals when being treated.

OBJECTIVES BY UNIT	CONTENT
Objective 9 Plan a farm medicine chest. List minimum equipment and contents that should be kept on hand for dairy herd health use.	A. Equipment . Nose lead . Cow halter . 8ft. length sash cord . Drench bottle . Trocur & cannula . Balling gun . Hypodermic needle . 40' length of ½" rope . Electric clippers . Dehorning equipment . Wash basin . Hoof knife . Thermometer B. Medicine and materials . Turpentine . Absorbine . Ginger (tea) . Mineral oil . Vaseline . Alcohol . Disinfectants . Epson salts . Udder balm . Castor oil . Sterile cotton . Sterile gauze bandages . Tincture of iodine C. Drugs that are fresh that may be prescribed by veterinarian for use as: . Sulfa drugs . Destrose . Calcium gluconate . Mastitis antibiotics . Autibiotics D. Problems of keeping medical chests: . Space requirements . Location of chests . Type of chest . Safety

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion of the equipment and supplies needed for herd health based on group observations on field trips and study of specific diseases. B. Slides showing well equipped medical chest and contents Observations of equipment on field trips taken previously in module. C. Study of drug information and package labels as to strength, use, and dosage recommendations	A. Students prepare list of equipment needed for medical chest together with costs of items. B. Students prepare an actual chest for demonstration purpose as an open house or fair exhibit.	A. Oral test of equipment and what items are to be used for. B. Written test.

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Title - DAIRY HEALTH AND DISEASE

OBJECTIVES BY UNIT	CONTENT
Objective 10 Name the state and federal regulations requirements for the marketing of cattle, milk and dairy animals.	A. Marketing cattle . Intra-state shipment procedure . Inter-state shipment procedure B. Marketing milk . Barn conditions . Yard and pasture conditions . Equipment and facility sanitation . Cattle health requirements . ring test . health examinations . TB testing . Antibiotics and withholding milk C. Marketing dairy animals . Antibiotic restrictive

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DAIRY HEALTH AND DISEASE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion of regulations regarding sales of animals at both public and private sale. Examination of sale catalogs for health regulations B. Tape interview with veterinarian and/or local cattle dealer in regard to livestock C. Lecture discussion of health & sanitation regulations of local milk companies. Guest speaker area field man or inspector for state and federal market regulations of local milk company. D. Examination of written health regulations for the federal & state marketing health regulations.	A. Notes taken on the requirements for cattle sales-health requirements and milk market regulations.	A. Written test.

MODULE OF INSTRUCTION

Title - DAIRY HEALTH AND DISEASE Code - 01.01010101-04

RESOURCE MATERIALS

Books:
Dairy Cattle Science - M.E.Ensminger, Interstate, Danville, Illinois
Veterinary Guide for Farmers - G.W.Stumm, Hawthorn Books, New York
Dairy Cattle Feeding & Management - Reaves & Henderson, J.M.Wiley & Sons, New York
Modern Dairy Cattle Management - Davis, Prentice Hall
Yearbook of Agriculture 1956 - Disease
Animal Health Handbook - Pfizer
Agriculture in Our Lives - Kerbs, Interstate
Approved Practices in Dairying - Mortenson & Juergensen, Interstate
Feeds & Feeding - Morrison
The Science of Dairy Farming - H.R.Webster Feed Company
Profitable Dairy Management - Beacon Feed Companu
Hoards Dairyman Herd Health Book - W.D.Hoard

Bulletins:
A Dairy Herd Health Program. Dairy herd disease control committee of N.Y. State Veterinary Medical Society
Dairy Herd Management. Bulletin 998. Bradt.
Programmed Dairy Herd Health. Smith D.V.M., Canton Ag. & Tech.
Feeding the Dairy Cow for Maximum Returns. Cornell Ext. Bull. 1156, Slack et.al.
Anchor Veterinary Handbook - latest edition

Periodicals:
Hoards Dairyman Magazine

Audiovisuals:
Mastitis - Slide Set - I.M.S.

Disease and Health Problems of Dairy Animals

Disease or Condition

Statement of Economic Importance

Causes - general and specific

Age Affected:

How Spread

Symptoms:

Treatment:

Prevention Measures:

The Permanent Record Card for Dairy Cattle was designed for use as a permanent, complete, life record of a dairy cow in either a grade or registered herd. The record was designed primarily for use in herds that develop their own herd replacements from cows that have demonstrated their superior ability for milk production, type characteristics and health.

This record meets the requirements of herd records in that it is convenient, compact, and will supply most of the desired information about an individual animal. The record is convenient to use in that it can readily be filed in a file box or carried in a shirt or jacket pocket. It is compact as well. Approximately one-hundred cards can be filed in one inch of space. If further information is needed a regular 5" X 8" card can be attached to the record and the file will remain neat and orderly.

The record lends itself to the selling of cattle for reasons that the record can be reproduced in advertising mediums. It tends to be more businesslike to have a single record with all information available when showing a prospective buyer the animal. When a sale is made, either at public or private treaty, a copy of the record should be made available to the buyer while the original card remains in the permanent records.

The health record is designed to be kept up to date as needed. This is of great value when studying individual animals or families for health problems. Where the code would not cover the conditions in the herd further codes can be developed. It would be suggested that an explanation of the code additions be made at the end of the code information on all cards so noted.

The record card provides spaces for all information regarding an animal that is of primary importance to the dairyman. However, as with any record, to be of the greatest value the record must be kept up to date. This means that as events take place they should be recorded. This is especially true in the health record and including the breeding information. The record will be only as valuable as the farmer wishes to make the record.

Over a period of years the record will show the gains in the breeding program. The records will show the desirable cow families and individuals that can transmit, or have transmitted over the years. The column for herd average for the year is in itself the best means of answering the cull-keep question.

The information below and in the following pages are the instructions for keeping the record card.

A. FRONT OF THE CARD

1. IDENTIFICATION INFORMATION:

a. Cow - The name of the animal whose record is to follow. (For registered cows the registration number would be written below the name.)
b. Birth - The date of birth written in figures (month-day-year).
c. Disposal - The date of disposal of the animal in figures.
d. Eartag - The eartag number of the animal (registration number if not entered)
d. Record No. - This is the animal's individual number which is never repeated The first number is 1 and following forward.

e. Dam - The name of the mother of the animal
f. No. - The number of the dam.(That is the dam's record number from her file card)
g. Sire - The name of the father of the animal.(This could be the sire's code name if used in artificial insemination).
h. NS-AS Check (✓) if the animal was sired by natural (NS) or artificial (AS) service.
i. R-G Check (✓) if the animal is registered (R) or a grade (G).

2. PRODUCTION RECORD INFORMATION

a. Yr. - The calendar year that the record was begun.
b. Mos. - The age of the animal in months or years and months at the time the record was begun.
c. Weight - The weight of the animal during the lactation period(at the beginning of the record).
d. Days Recd. - The number of days that the animal was milked in the lactation.
e. Days Dry - The number of days that the animal was dry at the end of the lactation and before freshening to start a new lactation.
(Records are figured from freshening date to freshening date)
f. *Prod.Milk - The total milk produced in pounds for the lactation.*
g. % - The mean butterfat test for the lactation
h. *Lbs.Fat - The total butterfat produced during the lactation.*
(*Both the milk and fat production can be expressed as either actual production or as mature equivalent 2 X. However, whichever is used the herd average should also be the same. Further comments will be expressed below)
i. Total value - The calculated returns based on the price of milk for the year.
j. Feed costs - The calculated costs of all feeds (grain-hay-silage-pasture) for the year.
k. Returns - The profit or loss expressed as a (/) or a (-).
l. Herd Average - The calculated herd average for the herd minus the animal's production record. For larger herds the average should reflect the season of the year in which the animal freshened (Mar.-Aug. Sept.-Jan.)(This column has the greatest use in determining the cull or keep on the animal in question.)
(The records here should be in the mature basis. If the animal's record above is based on the actual then the mature record 2 X 305 should be placed in the remarks section next to the herd average.)

3. REPRODUCTION RECORD INFORMATION

*a. Date Bred - The date that is the service date resulting in conception
b. Sire - The sire that was the parent of the calf
c. Cow's Wt. - The weight of the cow at the time of calving
d. Calf's Wt. - The weight of the calf by tape or the number inches of heart girth
e. Sex - Either male or female as M or F
f. Date/Method Disposal - The date that the animal left herd with the reason or method of disposal (if lacking room for materials put in remarks)
g. Name - The name of the animal together with it's code and registration date (if registered) only if animal is going to be raised as herd replacement
h. Remarks - If there is any problem of calving it should be entered here. If the animal was sold the price and new owner's name should be entered. If bob calf then the price received would be entered.
*Transfer material from breeding records of the herd to this sheet.

4. HEALTH AND BREEDING RECORDS INFORMATION

a. This record is to be kept on the animal beginning at birth and continuing through the time that the animal leaves the herd. Entries are made in the correct year column and on the line for the correct month. The entry consists of the date of the month and the code letter for the condition.

1. Examples: a) PE/6 - Physical Examination B/3 Birth
6th of the month 3rd of the month

b. Where treatment is not suggested by the code enter the letter "T" and the date as "T/10a"/. The small letter refers to any remark that is necessary and should be entered in the remarks at the bottom of the card. Be sure to include the small letter at the beginning of the information.

c. If it is desired further development of the code is possible to cover conditions not included in the list. It should be suggested that such additions to the code be added to the end of the code list.

5. MISCELLANEOUS INFORMATION

a. Reason for Disposals:- The general or specific reason for the removal of the animal from the herd.
b. Weight at Birth: - The weight of the animal when it was born either in pounds or inches of heart girth.
c. Birth Problems: - Any problem that complicated the birth of the animal
d. Remarks: - The catch-all section that covers materials not included in the other sections or where there was a lack of room to include the information.

1. materials to include in this section:
   - a type scores and classification
   - b show records and awards
   - c special honors of the breed
   - d price paid and from whom purchased together with the date of the purchase
   - e the price received, date and name and address of the buyer if sold as a herd replacement
   - f medical treatment not covered in the Health and Breeding Record

The record card presents a place for all necessary information that would be needed by a farmer raising his own herd replacement. The farmer has only to make the entries as they arise. It would be suggested that such entries be taken care of at the time the event took place. DO IT NOW AND DO NOT PUT IT OFF, BECAUSE IF YOU DO IT PROBABLY WILL NEVER GET DONE. THE VALUE OF THIS OR ANY RECORD IS COMPLETENESS OF THE INFORMATION. THE HERDSMAN IS RESPONSIBLE TO SEE THAT THE INFORMATION IS THERE.

COW .... Birth: .... Disposal .... Eartag .... Record No. ....

(NS) (R)

DAM .... No. .... Sire .... (AS) (G)

PRODUCTION RECORDS

YEAR	MOS.	COW'S WEIGHT	DAYS RECD.	DAYS DRY	PROD MILK	%	Lbs. FAT	TOTAL VALUE	FEED COSTS	RETURNS	HERD AV.	REMARKS
TOTALS												

REPRODUCTION RECORD

DATE BRED	SIRE	DATE FRESH	COWS WEIGHT	CALF'S WEIGHT	SEX	Date/Method DISPOSAL	NAME	REMARKS

HEALTH AND BREEDING RECORD

MO.	YR. 59	YR. 60	YR. 61	YR. 62	YR. 63	YR. 64	YR. 65	YR.	YR.
Jan	B/20 S/30	H/12			C/31 MF/31	D/B			
Feb		H/3 S/10-14 H/24	C/1 A/B/14	S/10 MF/BA/12 K/20 H/28	K/12 OF/19-31 H/30				
Mar		H/17	H/1,23 I/25	OF/19 H/21	H/21 I/29				
Apr		H/4 BA/25	H/14	I/10	H/12				
May		BA/16	BA/5	BA/1	BA/3 BA/10 24				
June									
July	T1/20	F/14 T2 17/20	P/10 T/20 PE/28	PE/1 P/15 T1/20	PE/10 P/30				
Aug	V/30		T/27	T/10 OF/15-17					
Sept				OF/1-3 20-21					
Oct									
Nov	H/30								
Dec	H/21			BT/2 D/27					

Code: B, birth; PE, phy. exam; A, abortion; H, heat; BA, artif. bred: BN, natural service; C, calving; P, pregnancy exam; A/B, afterbirth; B/T, bangs test; T/B, tb. test; S, scours; M, mastitis; F, foot problem; M/F, milk fever; O/F, off feed; T/H, heat treatment; V, vaccination; K, ketosis; C/O, cystic ovary; V/T, vibrosis; D, drydate; T, other treatment; DI, disposal. I involution

REASON FOR DISPOSAL:

WEIGHT AT BIRTH:
90 lbs.

BIRTH PROBLEMS:
None - Normal birth

REMARKS

H.S. - Hemorrhagic Sep.
* Vet treatment foot injury - Purple fluid
I - involution check
T27 Pinkeye
● Bloat.

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MODULE OF INSTRUCTION

Title - MANAGING THE MILKING HERD Code - 01.01010101-05

Description:

The milking herd is of extreme importance in the business of dairy farming. It is composed of the animals which consume the most roughage, and concentrates in the herd. These animals create the highest medical costs in the herd, and they are the only ones producing a return both in revenue from their product, and in their individual value. Good management of this segment of the dairy herd is essential for a profitable business.

Students enrolled in this module will be primarily involved with the care and feeding of the dairy herd, the use of production, and health records to maintain the profit balance of the milking herd. Efficiency of cow numbers vs. labor and buildings will also be emphasized.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Care and handling	1	8
2. Housing needs		6
3. Essential records	1	2
4. Feeding		6
5. Labor Management	1	5
	3	27

Revised January '75

MODULE OF INSTRUCTION

Title - MANAGING THE MILKING HERD　　　　Code - 01.01010101-05

OBJECTIVES to be obtained:

The student will be able to:

1. List 10 steps to be followed in a program for care of the individuals of the milking herd.
2. Milk a cow to the satisfaction of the instructor or cooperative farmer.
3. Recognize and remedy, to the instructors satisfaction, symptoms of at least six bodily malfunctions which could involve the milking cow.
4. List the recommended spacial requirements per head for (a) cows in loose housing, and (b) cows housed in conventional stables.
5. List six essentials of a good housing sanitation program
6. Complete examples of production, breeding, health, and account records for each of two given situations.
7. Determine, to the instructors satisfaction, the amount of forage, and concentrates to be fed per animal per day (in a given situation) using production record information, when the cow is on a dry lot feeding program.
8. Determine, to the instructor's satisfaction, the amount of feed supplement to be fed per animal (in a given situation) using production record information, when the cow is on a grazing program.
9. Determine the number of cows one man can handle efficiently.
10. Develop an incentive program which would tend to make a hired man want to stay with the business.

Code — 01.01010101-05

Title - Managing the Milking Herd

OBJECTIVES BY UNIT	CONTENT
Unit 1. Care and Handling Objective 1 List 10 steps to be followed in a program for care of the individuals of the milking herd	A. Factors to consider in the care and handling of cows B. Regularity of . Feeding . Cleaning . Milking C. Health D. Ventilation E. Sanitation F. Personal stability of handler G. Judgement of handler
Objective 2 Milk a cow to the satisfaction of the instructor or a cooperating farmer	A. Explain the milk secretion process . Observation . Practice
Objective 3 Recognize and remedy, to the instructors satisfaction, symptoms of at least six bodily malfunctions which could involve the milking cow	A. Diseases . Milk fever . Acetanemia . Cow pox . Mastitis . Foot rot . Hardware B. Injuries . Cuts . Bruises . Internal C. Other . Upset stomach . Pests D. Mastitis . Chronic . Acute

01.01010101-05 - Code

Managing the Milking Herd - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study, assign questions, have students look up answers to questions B. Classroom discussion	A. Note Taking B. Make the required list using the references available.	A. Oral or Written Test Name or list 10 steps to be followed in caring for the individuals of the milking herd.
A. Field trip to dairy farm at milking time. B. Demonstration Individual instruction C. Slides-The Cows Udder and How it Functions D. Film-The Science of Milk Production Rallston-Purina	A. Observation of demonstrated procedure. B. Practice the procedure.	A. Properly milk the cow to the instructors satisfaction or that of a cooperating farmer
A. Supervised Study B. Demonstration of techniques used in observing cattle. C. Field trip to dairy farm D. Slides on Mastitis Cornell IMS	A. Complete a list of diseases and malfunctions common to the dairy herd. List the causes, symptoms, and controls of each. B. Observe demonstration C. Practice techniques for detection of malfunctions	A. Written evaluation by the instructor. B. Instructors evaluation of the students ability to recognize symptoms of at least 6 malfunctions.

Code - 01.01010101-05

Title - Managing the Milking Herd

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Housing Needs Objective 4 List the recommended spacial requirements per head for both the conventional type and loose types of housing for the milking herd.	A. Conventional Barn . Stanchion . Tie Stall . length . width B. Loose Housing . Free stall . Loafing area
Objective 5 List six essentials of a good housing sanitation program	A. Freeness of obstructions B. Ventilation C. Pest Control D. Restriction of visitors E. Cleanliness F. Isolation
Unit 3 Essential records Objective 6 Complete examples of production, breeding, health, and account records for each of two given situations.	A. Breeding record form B. Health record form C. DHIC records D. Business records E. Emphasize DHIC or OS Records.
Unit 4 - Feeding Objective 7 Determine, to the instructors satisfaction, the amount of forage and concentrates to be fed per day (in a given situation) using production record information, when the cow is on a dry lot feeding program.	A. Roughage T.D.N. D.P. . Corn silage . Hay B. Concentrates . Grains used . Protein supplement C. Amounts needed by individual animals

01.01010101-05 - Code

Managing the Milking Herd - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised Study B. Field trips to area farms	A. Compile and record spacial requirements for both conventional and loose stabilizing systems. B. Design a new barn or design a remodeled old barn	A. Teachers evaluation of list of requirements B. Field trip reports
A. Supervised Study B. Lecture C. Field trip	A. Research in groups of 2 and prepare a class report for one essential of a good sanitation program. B. Note taking on peer reports and lecture.	A. Oral or written test on the essentials of good sanitation program B. Teacher evaluation of completed record forms
A. Lecture - use of each record B. Demonstration in use of each record C. Supervised practice on given situations	A. Note taking B. Complete records for the teacher-given situations	A. Teacher evaluation of completed record forms
A. Preparation of mimeograph charts to be used in acquiring information found in content B. Demonstration of the use of these charts C. Guest speaker -- Extention specialist or Feed Co. Fieldman D. Supervised study E. Chalk & Board for problem solving	A. Use charts and references to determine the amounts to be fed for the given situation	A. Examination using adequate references Solve two problems related to T.D.N & D.P. requirements.

Code - 01.01010101-05

Title - Managing the Milking Herd

OBJECTIVES BY UNIT	CONTENT
Objective 8 Determine, to the instructor's satisfaction, the amount of feed supplement to be fed per animal (in a given situation) using production record information, when the cow is on a grazing program.	A. Roughage T.D.N. D.P. . Corn silage . Hay B. Concentrates . Grain used . Protein supplement C. Amounts needed by individual animal
Unit 5 - Labor Management Objective 9 Determine the number of cows one man could handle efficantly	A. Factors: . Type of handling system . Other jobs required of the individual . Average milk cows per man in area . Average milk cows per man in State . Average milk cows per man of farms of students in class . Recommendations by the State College of Agriculture
Objective 10 Develop an incentive program which would tend to make a hired man want to stay with the business.	A. Purpose of plan B. Types of incentives . Production . Increase equity . Profit sharing C. Principles for success . Items creating employee interest . Training - preparation to do job as employer wishes D. Consistency . Title - Farm Manager, Farm Mechanic, Herdsman . Delegation of Authority . Wages - Competitive, tangible . Working hours . House . Farm products - beef, milk . Incentives and involvements . Weekends and vacations

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use mimeo charts prepared for Objective #7. B. Supervised study C. Chalk and Board . Work out problems	A. Use charts and references to determine the amounts to be fed for the given situation B. Make calculations for own herd	A. Written Test . Two problems
A. Supervised study B. Guest speaker—Coop. Ext. Specialist	A. Determine the number of animals which can be handled per man in each of these situations. .. Milk cows—and no other jobs .. Milk cows and care for calves and young stock . Milk cows-calves & young stock, & soil preparation	A. Teacher evaluation of student written decisions in each situation
A. Discussion of problem B. Supervised study-incentive C. Guest speaker of a successful operation and his employee D. Lecture	A. Preparation of sample incentive plan B. Group evaluation C. Note Taking . Compile a list of items which can be used to create employee interest and longevity . Select the one which can be of the most benefit	A. Teacher evaluation of students incentive programs

MODULE OF INSTRUCTION

Title - MANAGING THE MILKING HERD Code - 01.01010101-05

RESOURCE MATERIALS

Books - Modern Dairy Cattle Management, Davis, Prentice Hall.
Dairy Production, Diggins and Bundy, Prentice Hall
Successful Dairying, Knodt, McGraw Hill
Feeds and Feeding Abridged, Morrison, Morrison Publishing Co.
Dairy Cattle Selection and Feeding, Yapp and Nevens, Wiley

Bulletins -

1. Any available from local feed companies, especially on housing.
2. Farm business chart - I.M.S. Cornell University, Stone Hall, Ithaca, N.Y.
3. Health record from I.M.S. Cornell University, Stone Hall, Ithaca.
4. Incentive Programs for Hired Man, Ag. Ext. 49
5. Managing the Dairy Herd (unit for teachers) I.M.S., Cornell Univ. Stone Hall

Periodicals -

Successful Farming
Hoards Dairyman
Farm Journal
Pennsylvania Farmer

Audivisuals -

Consult Cornell IMS List.

Code- 01.01010101-05
Title- MANAGING THE MILKING HERD

LCC 66:80

TERMS OF EMPLOYMENT
FOR YOUR HIRED HELP
(check sheet)

	Yes	No	Comment
Output of products per man above average			
Wages above average			
Scocial Security			
Perquisites			
House			
Running water			
Central heating			
Electricity			
Telephone			
Fuel			
Milk			
Meat			
Eggs			
Fruit and vegetables			
Other______________			
Incentive payments			
Regular working hours			
Vacation with pay			
Workman's insurance			
Health insurance			
Unemployment insurance			
Written agreement, annual review			

MODULE OF INSTRUCTION

Title - BEEF PRODUCTION Code - 01.01010102-01

DESCRIPTION:

Beef makes up a major portion of the American diet. A steady diet of good beef has been proven beneficial for body growth in human beings. The American publics demands quite often exceed the supply since it has grown to realize the ability of beef to provide the high amount of protein needed for human growth and development. The price of beef has increased directly with its demand, resulting in a need for an increased amount of beef produced.

This module will involve the student in the development of skills needed to maintain a successful beef operation. The student will develop the skills needed for selecting, starting, and finishing beef for human consumption.

The skills of selecting, castrating, dehorning, clipping, hoof trimming, treating diseases and fitting and showing beef cattle will be emphasized.

Field trips to beef farms, and slaughter and packing facilities will be used to familiarize the student with other segments of this industry.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Breeding and Selection of Beef Animals.	2	3
2. Beef Health	2	3
3. Feeding, growing and fitting beef	2	6
4. Housing requirements and equipment	2	3
5. Finishing and marketing	2	5
	10	20

Revised June, 1974

MODULE OF INSTRUCTION

Title - BEEF PRODUCTION

Code - 01.01010102-01

OBJECTIVES to be obtained:

The student will be able to:

1. Recognize by sight and list from memory the breed and origin of at least six beef breeds of cattle.
2. Compose to the instructors satisfaction, and send a letter requesting information concerning cattle pedigree registration, and artificial insemination restrictions to at least one beef breed association.
3. Name and recognize by sight at least five crosses and other varieties presently being used for beef. Select the one of most interest to you, and describe its origin and two reasons for its use.
4. List from memory 25 parts of the beef cow.
5. List ten of the twelve factors to be considered when judging or selecting beef cattle.
6. Judge with at least 50% accuracy three classes of beef cattle.
7. List and record causes, symptoms and controls of at least 20 diseases found in beef cattle.
8. Outline a health program for beef cattle.
9. Organize a program to follow for feeding beef from birth to six months of age.
10. Organize a program to follow for feeding beef breeding stock from six months of age to maturity.
11. Organize a program to follow for feeding beef from six months of age to finish.
12. Demonstrate the ability to fit a beef animal for show.

MODULE OF INSTRUCTION

Title - BEEF PRODUCTION

Code - 01.01010102-01

OBJECTIVES to be obtained:

(continued)

13. Diagram a housing arrangement for a given number of cattle, including a breakdown of total cost of construction, and show the method of calculating the capacity.

14. Select the type of feeding and watering system to be used for raising beef, and list five reasons why this one was selected.

15. Name the feeding system to be used in finishing beef for market, and list two reasons for quality differences.

16. Locate five facilities available for marketing the finished product.

Code - 01.01010102-01

Title - BEEF PRODUCTION

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Breeding and Selection of Beef Animals Objective 1 Recognize by sight and list from memory the breed and origin of at least six breeds of beef.	A. Breeds of beef cattle . Aberdeen Angus - Scotland . Red Angus - U.S. . Hereford - British Isles . Polled Hereford - . Brahman - India . Charolais - France . Semintal - Northern Europe . Santa Gertrudis - U.S. . Shorthorn - British Isles . Polled Shorthorn -
Objective 2 The student will compose, to the instructors satisfaction and send a letter requesting information concerning cattle pedigree registration and artificial insemination restrictions to at least one beef association.	A. Necessary information . Breed characteristics . Pedigree structure . A. I. restrictions . Interrelationship of parents' abilities . Basic requirements for letters (review)

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Slides of examples of each breed. C. Field trip to farms having as many of the major breeds as possible. D. Use of available magazines . Breed association magazines. . Ag. Ed. Bulletin 1011 . Beef Cattle Husbandry . Animal Science	A. Research and discover origin of each breed. B. Make a chart showing the following information for each breed . Origins - . date of first importation . average mature weight . average marketing weight . average birth weight . average weaning weight	A. Written or oral test . Name the breed and origin of the breeds of beef cattle.
A. Lecture B. Supervised study	A. Note taking . Write a letter to a breed association requesting information about requirements for registration.	A. Instructor's evaluation of written letter.

Code - 01.01010102-01

Title - BEEF PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Objective 3 Name and recognize by sight at least five crosses and other varieties presently used for beef. Select the one of most interest to you, and describe its origin and reasons for its use.	A. Cross breeds . Santa Gertrude's - Brahman X Shorthorn . Brangus - Brahman X Angus . Beefmaster - Brahman X Hereford X Shorthorn . Charbray - Brahman X Charolais - Charolais X Angus - Charolais X Hereford B. Dairy Beef . Large boned dairy breeds weighing over 100 lbs. at birth. . Usually Holsteins
Objective 4 The student will identify from memory, at least 25 of the parts of the beef cow.	A. Parts . Back . Barrel . Feet and legs . Rump
Objective 5 The student will list ten of the 12 factors to be considered when selecting Foundation or replacement stock.	A. Factors to consider - . Purebred or grades . Selection of breed . Size of herd . Uniformity . Health . Condition . Age and longevity . Reproductive ability . Milking ability . Size . Adaptation . Price

01.01010102-01 - Code

BEEF PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Discussion - Cornell Ext. Bull. 1011 C. Test . Animal science . Beef cattle husbandry	A. List and discuss crosses, and their origination. B. Prepare an oral report on the one cross most interesting to student.	A. Oral or written test on recognition of breeds. B. Teacher evaluation of oral report.
A. Chart - Ref. Parts of a Beef Animal B. Lecture C. Using judging scorecard, naming and pointing out the parts. Use a slide showing cow with parts labeled.	A. Note taking B. Label the parts in their proper places on the drawing of a cow.	A. Written test . Given the name of the parts of a cow the student will locate at least 25 on a drawing of the animal.
A. Lecture B. Student discussion C. The judging manual	A. Note taking B. Listing C. Factors to consider in selection.	A. Test - Oral or Written . Name ten factors to be considered when selecting foundation or replacement of stock.

OBJECTIVES BY UNIT	CONTENT
Objective 6 Judge with at least 50% accuracy three classes of beef cattle.	A. Categories of beef judging . Confirmation . Natural fleshing . Breed and sex characteristics . Constitution . Feet, legs and bones B. Judging techniques . Consistency . Classifications . General appearance . Beef characteristics
Unit 2 - Beef Health Objective 7 List and record causes, symptoms and controls of at least 20 diseases found in beef cattle.	A. Diseases to be considered . Scours . Pneumonia . Ringworm . Mange . Lice . Grubs . Tuberculosis . Freemartin . Internal parasites . White muscle disease . Dysentary . Pink Eye . Warts . Influenza . Hemoragis Septicemia . Leptospirosis . Navel infection . IBR . Deficiencies . Virbiosis
Objective 8 Outline a health program to follow for beef cattle.	A. Application of knowledge studied . Immunizations . Antibiotics . Disease prevention methods . Coordinated for daily use

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Slides on yield grades C. Lecture (short) D. Slides of beef judging E. Demonstration of judging F. Field trips for judging	A. Notes on reasons and evaluation of each category. B. Note taking C. Discussion D. Practice judging	A. Oral or written test . Name the categories used in judging beef. . Evaluation to more than 50% accuracy demonstrated in judging of three classes of beef.
A. Supervised study - assign each student to prepare oral report on cause symptoms and control of three diseases. . References - . Beef cattle . Animal Health and Disease Control . Cattleman's Handbook . Ag. Ed. Bull. 1011	A. Prepare oral reports on assigned diseases. B. Class discussion.	A. Instructor evaluation of disease record.
A. Supervised study - Ag. Ed. Ext. 1011 B. Class discussion	A. Use of information previously acquired to outline a health program to be followed in raising Diary Beef Calves.	A. Instructor's evaluation of health program.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Feeding, growing and fitting beef Objective 9 Organize a program to follow for feeding beef from birth to six months of age.	Birth to six months A. Range with Brood cow . Feeding schedules for beef calves . calf's digestive tracts . liberal milk feeding . using milk replacer . limited milk feeding plus a dry calf starter . nurse cow method . skim milk method . Water . Hay . Antibiotics . Silage . Pasture . Minerals . Vitamins
Objective 10 Organize a program to follow for feeding beef breeding stock from six months of age to maturity.	A. Six months to maturity . Pasture . Roughage . Concentrates . Water . Vitamins . Minerals

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Film strip on raising Beef calves C. Panel discussion References - . Feeds and Feeding Abridged . Raising Diary Calves and Heifers (Bulletin) . Animal Science . Agway Tenderlean beef program . Beacon Tenderlean Program 3rd Edition D. Movie - Calf Rearing	A. Procure information concerning feeding programs for calves. B. Panel discussion - Feeding whole milk vs. milk replaces. C. Outline the feeding program.	A. Instructor evaluation of Feeding Program.
A. Supervised study - Ref - . Feeds and Feeding abridged . Raising dairy calves and heifers (bulletin) B. Field trip to a beef cattle raising operation.	A. Procure information concerning feeding programs for calves. B. Outline the feeding program.	A. Instructor evaluation of feeding program.

OBJECTIVES BY UNIT	CONTENT
Objective 11 Organize a program to follow for feeding beef from six months of age to finish.	. Six months to finish A. Conventional Beef . Pasture . Without pasture . Concentrates . Water . Vitamins and minerals B. Dairy Beef - . Tenderlean Program . beacon . agway . wayne
Objective 12 Demonstrate the ability to fit a beef animal for show.	A. Fitting . Calves creep feeding . Cattle Feed rations . Overconditioning . Underconditioning B. Showing . Clipping . Separation . Form . Cleanliness . Showmanship
Unit 4 - Housing requirements and equipment Objective 13 Diagram a housing arrangement for a given number of cattle, including a breakdown of total cost of construction, and show the method of calculating the capacity.	Building Requirements A. Special Needs . 5 sq. ft./100 lbs. of weight B. Shelter . Draft free, Warm 40° - 50°, dry C. Accessibility for cleaning . Not extremely important for calf pe . Easily disinfected every 6 weeks D. Temperature regulation . Electricity - Heat lamps for winter . Exhaust fans E. Handling facilities . Chute for restricting . dehorning . medicinal purposes F. Cost of - Housing . Property . Escavation . Materials . Handling . Labor of construction . Personal labor

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study - using references from list in objective 9 and below . Ref - . Agway Tenderlean Beef Program . Beacon Tenderlean Program 3rd Edition	A. Panel discussion of Dairy beef system vs. conventional beef system. B. Outline the feeding program.	A. Instructor evaluation of feeding program.
A. Supervised study - References - . Building a Champion . 100 best fitting formulas . A.G. Bull. 1011 B. Guest speaker C. Demonstration D. Field trip E. Supervised practice	A. Note taking of rules to follow in fitting. B. Discussion C. Practice showing	A. Teacher Evaluation B. Demonstration of clipping and trimming techniques
A. Supervised study - References - . Beacon - Tenderlean Bull. (2nd Edition) . Animal Science . Animal Health and Disease Control . Livestock Magazines B. Field trip to farm raising calves. . Beef cattle Husbandry C. Field trip to farm maintaining older cattle D. Lecture E. Discussion F. Use of phone to search material costs	A. Break class into groups to: . Research and record the needs of housing tenderlean calves. . Research and record the needs of housing for dairy or other beef calves B. Discussion C. Draw diagram of 3 sided pole shed for a given situation. D. Note taking E. Use the phone or visit material suppliers, seeking material and handling cost information. F. Contact contractors seeking labor cost.	A. Teacher evaluation of drawn diagram. B. Teacher evaluation of bill of materials.

OBJECTIVES BY UNIT	CONTENT
Objective 14 Select the type of feeding and watering system to be used for raising beef, and list five reasons why this one was selected.	Considerations A. Home built . Cost . Time . Ones own ability . Availability of materials B. Purchased - . Quality . Cost . Availability C. Equipment Needed - . Feed bunk . Self feeder . Winter proof watering . Mineral boxes . Hay rack . Scale . Restricting chute . Loading chute
Unit 5 - Finishing and Marketing Objective 15 Name the feeding system to be used in finishing beef for market, and list two reasons for quality differences.	Cattle finish A. Age goal - . Conventional steers 15-24 months . Dairy beef - 12 months . graze at 1 year of age and then - . dry lot feed for 100 days . gradual change from roughage - grain to full feed grain . concentrate feed - 1000 lbs/head . dairy beef - 12 months . dry lot feed only - . total concentrate - 3000 lbs/head B. Reasons for quality differences . Underfinishing - . animals which should have been culled . insufficient feeding conditions . lack of water . Over finishing . overfeeding . early finish lower quality . Economy . total cost of raising animals . cost per day of raising animals . profit margin over feed cost

EDUCATION

01.01010102-01 - Code

BEEF PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Discussion group C. Supervised study D. Inquiry for information concerning costs of equipment.	A. Note taking B. Prepare panel discussion with two groups of selected students - subject - Home built vs. Purchased C. List personal preferences and five reasons why.	A. Teacher evaluation of lists and reasons.
A. Supervised study References - . Agric. Ext. Bull. 1011 B. Guest speaker panel . Butcher . Feeder . Livestock marketer	A. Each student choose one method of finishing cattle and defend it by listing and rally reporting only on its desirable points class discussion. B. Record notes on panel . Discuss and question speakers. C. Select students to plot a growth curve for - . Underfinished animals vs. Economy . Overfinished animals vs. Economy.	A. Teacher evaluation of oral report. B. Oral or written - . test on reasons for quality differences.

Code - 01.01010102-01

Title - BEEF PRODUCTION

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Objective 16 Locate five facilities available for marketing the finished product.	Facilities A. Friends and relatives B. Local slaughter and retail facilities C. Chain store D. Livestock markets E. Dealers F. Return prices - supply and demand

01.01010102-01 - Code

BEEF PRODUCTION - Title -

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Problem solving discussion of live supervised research. B. Let each student locate two available facilities, and report.	A. Contact available prospective buyers of the finished product, report findings to class. B. Make note of projected values.	A. Instructor's evaluation.

MODULE OF INSTRUCTION

Title - BEEF PRODUCTION

Code - 01.01010102-01

RESOURCE MATERIALS

Books:
Diggins & Bundy. Dairy Production. 2nd ed. Prentice-Hall, Englewood Cliffs, N.J.
Cattlemans Handbook by Springer Interstate
Sanitation and Disease Control by Dykstra Interstate
Animal Science by Ensminger - Interstate
Beef Cattle Husbandry, Ensminger, Interstate

Bulletins:
100 Best Fitting Formulas for Blue Ribbon Beef, Albers Milling Co. 1061 Central St., Kansas City, Mo.
4-H Bulletins - Calf Raising. Agric. Ed.
Agway
Purina - Building Champions
Wayne
Beacon
Other Food Companies

These companies are known to prepare bulletins, which may be procured from local feed dealers.

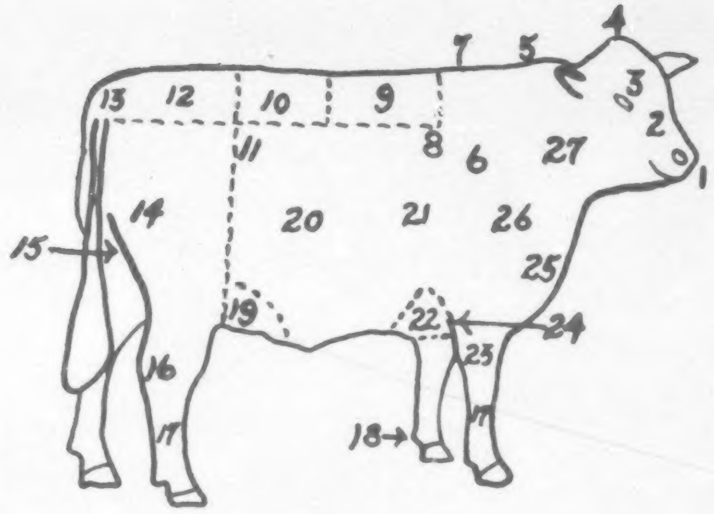
I.M.S. Stone Hall, Cornell University, Ithaca, New York
Ag. Ext. Bulletin 1011 - Raising Beef Cattle in N.Y.S.

Periodicals:
Farm Journal Magazine
Successful Farming Magazine
Breed Association Magazines or Journals
Feed Company News
American Agriculturalist
American Stockman

Audiovisuals:
Movie Calf Rearing - Purina Feeds, Ralston Purina Co. Checkerboard Square, St. Louis, Mo.
Wayne Feeds

Parts of a Beef Animal - Chart from Walkayr Ed. Service, 126 Park Drive, Williamsville 21, New York

PARTS OF A BEEF ANIMAL



......Arm
......Back
......Brisket
......Crest
......Crops
......Dew Claw
......Elbow
......Face
......Forehead
......Fore Flank
......Fore Ribs
......Hind Flank
......Hip (Hook)
.....,Hock
......Loin
......Muzzle
......Neck
......Poll
......Point of Shoulder
......Ribs
......Round
......Rump
.....Shanks
......Shoulder
......Tail Head
......Twist
......Withers

KEY

1. Muzzle
2. Face
3. Forehead
4. Poll
5. Crest
6. Shoulder
7. Withers
8. Crops
9. Back
10. Loin
11. Hip (Hook)
12. Rump
13. Tail Head
14. Round
15. Twist
16. Hock
17. Shanks
18. Dew Claw
19. Hind Flank
20. Ribs
21. Fore Ribs
22. Fore Flank
23. Arm
24. Elbow
25. Brisket
26. Point of Shoulder
27. Neck

SUGGESTIONS TO GROUP LEADERS:

(1) Give each member one copy of this lesson and let him study the picture and list of parts for 15 minutes.

(2) Make a game of it; divide club into 2 teams, have each fold the page at the dotted line; have "name down" by asking members of each side, alternately, to name a part as you call the number.

(3) At second meeting, have members study picture again, then have them fold on dotted line and write correct number on blank in front of names of parts listed

(4) Visit a beef farm and have members point out the parts on a real animal.

WALKAYR EDUCATIONAL SERVICE
126 Park Drive
Williamsville 21, N. Y.

MODULE OF INSTRUCTION

Title - HANDLING THE FOAL Code - 01.01010103-01

DESCRIPTION:

The student will practice the proper and safe procedure of approaching and catching a foal in a box stall and in an enclosed lot. The art of leading a foal as well as trimming its feet will be demonstrated and practiced. The articles of good grooming and the equipment necessary to accomplish this task will be practiced. Many techniques will be discussed in constraining of a foal and at least five different skills will be practiced in administering of medications.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Catching and leading	1	6
2. Constraining methods	2	5
3. Trimming hooves		6
4. Grooming the foal		4
5. Administrating medications	2	4
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - HANDLING THE FOAL

Code - 01.01010103-01

OBJECTIVES to be obtained:

The student will be able to:

1. Approach and catch a foal in a stall and in a fenced lot.
2. Demonstrate the proper procedure for leading and tying a foal using a halter, lead line and a cross tie.
3. List three methods of restraining a foal and demonstrate at least one of them.
4. Safely pick up the front and back hooves of a foal (while it is tied in a cross tie) and demonstrate a method of caring for a foal's hooves.
5. Demonstrate the proper methods of grooming a foal.
6. Demonstrate how to clip the head and legs of a foal, using electric clippers.
7. Demonstrate the proper procedure of constraining a foal.
8. Enter a foal's stall without the foal escaping.
9. Use instruments such as a syringe, tube and hypodermic needle, to administer medication to a foal in at least five different ways.

Code - 01.01010103-01

Title - HANDLING THE FOAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Catching and leading Objective #1 Approach and catch a foal in a stall and in a fenced lot.	A. Haltering B. Roping - 30 feet
Objective #2 Demonstrate the proper procedure for leading and tying a foal using a halter, lead line and a cross tie.	A. Lead line use B. Cross tying
Unit 2 - Constraining methods Objective #3 List three methods of restraining a foal and demonstrate at least one of them.	Use of: A. Twitch B. Ropes C. Straps D. Hobbles E. Other

EDUCATION

01.01010103-01 - Code

HANDLING THE FOAL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discuss and list on board precautionery measures needed for student safety. B. Demonstrate how to make a temporary stall with a 30 ft. rope in a corner of a field. C. Demonstrate to student proper procedure of putting a halter on a foal. Cpt 3 page 112* D. Supervised practice.	A. Enter stall using all precautionary measures to safeguard the student - put halter on foal. B. Turn foal out into a fenced lot. Using a rope approx. 30 ft. long, make a temporary stall with the rope to capture the foal.	A. Teacher assessment of demonstrated procedures.
A. Demonstrate the use of a lead line. B. Lecture and list on board the dangers of a cross tie, Cpt 3, pg 115* C. Discussion and list on board the advantages of using a cross tie. D. Demonstrate leading. E. Supervised practice.	A. Connect a lead line to foal's halter. Attach a long rope around behind the foal and teach the foal to lead. All leadsmen must have an assistant to help prevent injury to the foal. B. Lead foal to an alley in the barn. Fasten foal to cross ties. Student and assistant must remain with foal to prevent any injury to the foal.	A. Teacher assessment of demonstrated procedures.
A. Illustrate procedure of keeping foal on opposite side of the stall when attendant enters the stall. B. Demonstrate how to apply a twitch on a foal's nose and ears. C. Tie up one front leg D. Throw a foal with the aid of ropes. E. Use a large flat instrument such as a broom to force a foal to go to opposite side of stall when an attendant enters the stall. *Care and Training of Trotters and Pacers.	A. Students demonstrate how to keep a foal away from the front end of a stall when the student enters the stall. B. Students must apply a twitch on a foal's nose and ear (gently). C. Demonstrate the procedure used in "casting" a foal in a stall. D. Using a strap, tie up one front foot of a foal.	A. Oral or written quiz. B. Teacher assessment of each student demonstration.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Trimming hooves Objective #4 Safely pick up the front and back hooves of a foal (while it is tied in a cross tie) and demonstrate a method of caring for a foal's hooves.	Use: A. Hoof pick B. Rasp C. Hoof knife
Unit 4 - Grooming the foal Objective #5 Demonstrate the proper methods of grooming a foal.	Use: A. Curry comb B. Body brush C. Cloth D. Comb
Unit 4 Objective #6 Demonstrate how to clip the head and legs of a foal, using electric clippers.	Use: A. Clippers

EDUCATION

01.01010103-01 - Code

HANDLING THE FOAL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration - proper methods of picking up a foal's feet off the ground. B. Discuss and illustrate on board or overhead the proper angle of front and hind hooves. C. Demonstrate the proper use of a hoof knife, hoof pick and rasp. D. Supervised practice	A. Each student will pick up all four feet of a foal using all safety precautions discussed in class. B. Each student will demonstrate the proper use of a hoof pick, hoof knife and rasp.	A. Teacher assessment of students demonstration.
A. Demonstrate proper use of the curry comb, body brush, mane and tail comb and soft cloth as a wiping cloth. B. Supervised practice.	A. Place foal in a cross tie - thoroughly cleaning the coat of the animal using curry comb, body brush, mane comb and soft cloth. B. If necessary, prevent foal from tossing its head and proceed to clip the halter path and muzzle of the foal using a set of electric clippers.	A. Teacher assessment of student demonstration.
A. Review methods of constraining a foal. B. Illustrate on a board or overhead areas to be clipped i.e. halter path at poll, hairs around muzzle and hairs behind the fetlock joint. C. Demonstrate on the correct angle and type of clippers to be used. D. Supervised practice.	A. Place foal in a cross tie - thoroughly cleaning the coat of the animal using curry comb, body brush, mane comb and soft cloth. B. If necessary, prevent foal from tossing its head and proceed to clip the halter path and muzzle of the foal using a set of electric clippers.	A. Teacher assessment of student . Oral Test . Demonstration

Code - 01.01010103-01

Title - HANDLING THE FOAL

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Administering medication Objective #7 Demonstrate the proper procedure of constraining a foal.	Review: A. Leadline use B. Cross tying C. Twitch D. Ropes E. Straps F. Hobbles
Objective #8 Enter a foal's stall without the foal escaping.	A. Calmness B. Authority C. Gentleness D. Relaxation
Objective #9 Use instruments such as a syringe, tube and hypodermic needle, to administer medication to a foal in at least five different ways.	Use of: A. Drench bottle B. Rubber tube C. Hypodermic needle D. Feed

01.01010103-01 - Code

HANDLING THE FOAL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Review by discussion and supervised practice, objective #2 and #3.	A. Demonstrate how to keep a foal away from the front end of a stall when the student enters the stall. B. Apply a twitch on a foal's nose and ear (gently). C. Demonstrate the procedure used in "casting" a foal in a stall. D. Using a strap, tie up one front foot of a foal.	A. Teacher assessment of student procedure.
A. Class discussion. B. Demonstration C. Supervised practice.	A. Practice approach of foal.	A. Teacher assessment of student procedure.
A. Class discussion B. Demonstration. C. Supervised practice.	A. Give a foal or a horse 5 cc of water using a syringe. B. Squeeze the horse's nasal passages to force the horse to swallow. C. Demonstrate on a model the use of a hypodermic needle. D. Illustrate on a poster and then a model how to insert a rubber tube into a horse's stomach. E. List methods of concealing medicine in feed.	A. Teacher assessment of student procedure of: . Administering medication . Using no fewer than 5 methods.

MODULE OF INSTRUCTION

Title - HANDLING THE FOAL

Code - 01.01010103-01

RESOURCE MATERIALS

BOOKS -

Horse Science Handbook - 1964

Horse Science Handbook - Volume 3
by M.E. Ensminger - Pub - Agri-services Foundation, 3699 E. Sierra Ave.
Clovis, California

Care and Training of the Trotter and Pacer
by James C. Harrison
Pub. The United States Trotting Association
750 Michigan Avenue
Columbus, Ohio 43215

Horses and Horsemanship
by M. E. Ensminger
The Interstate Printers and Pub. Inc.
Danville, Illinois

MODULE OF INSTRUCTION

Title - HARNESS TRAINING OF HORSES

Code - 01.01010103-02

DESCRIPTION:

The student will study the types of harnesses, their functions and uses. The student will start with the basic ground training necessary for the preparation of hitching the horse to the training vehicle. The student will actually hitch, drive and perform the horse at different speeds and gaits. Arrangements will be made with the local race track for the students to observe the way of going so that irregularities or movement defects can be detected.

MAJOR DIVISIONS OR UNITS OF CONTEST	Time Allocations	
	Class	Other
1. Bitting Harness	1	2
2. Lunge Line and Long Line		2
3. Driving Harness and Hitching	1	2
4. Driving the Horse		14
5. Gaits and Speeds		5
6. Way of Going	1	2
	3	27

Revised June, 1974

MODULE OF INSTRUCTION

Title - HARNESS TRAINING OF HORSES Code - 01.01010103-02

OBJECTIVES to be obtained:

The student will be able to:

1. Identify all parts and functions of a bitting harness.
2. Put a bitting harness on a horse and make all proper adjustments.
3. Use a lunge line and a training whip to lunge a horse at the walk and trot in both directions.
4. Use long lines to drive a horse while walking behind the horse.
5. Identify all the parts and functions of a driving harness.
6. Adjust and properly fit a harness to a horse.
7. Hitch the harnessed horse to an appropriate two wheeled training vehicle.
8. Use the reins to guide the horse, and drive over a prescribed course.
9. Make the horse perform at his gaits at different speeds, while using training equipment.
10. Recognize through observations of the horse's leg movements, defects in the "way of going" of the horse.

Code - 01.01010103-02

Title - HARNESS TRAINING OF HORSES

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Bitting Harness Objective #1 Identify all parts and functions of a bitting harness.	A. The Harness . Surcingle . Crupper . Lunge Bridle . Open Bridle
Objective #2 Put a bitting harness on a horse and make all proper adjustments.	A. Open bridle B. Lunge bridle
Unit 2 - Lunge Line and Long Line Objective #3 Use a lunge line and a training whip to lunge a horse at the walk and trot in both directions.	A. Lunge Line - Ch. 16 Pg 674 H&H B. Training Whip *NOTE - There is some contradiction to the usefulness of lunging a horse. - Some horses should not be lunged, as sharp turns can cause further damage to those with bad stifles.
Objective #4 Use long lines to drive a horse while walking behind the horse.	A. Long lines B. Training whip

EDUCATION

01.01010103-02 - Code

HARNESS TRAINING OF HORSES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use wall charts on harnesses to identify parts. B. Assembly demonstration by teacher on a bitting harness - Ch. 3, Pg 116-121* C. Class discussion - list of advantages and disadvantages of a lunge bridle verses an open bridle made by instructor. D. Supervised study * (see B. above) Care and Training of Trotters and Pacers	A. Take notes B. Assemble - a complete harness C. Put harness on a horse D. Make all necessary adjustments for proper fitting. E. Note advantages and disadvantages of a lunge bridle. F. Fit lunge and open bridle on horse. G. Make adjustments for proper fitting.	A. Teachers' evaluation of students notes. B. Teachers' evaluation of students' ability to harness a horse and adjust.
A. Supervised practice	A. Practice fitting bridles.	A. Teachers' evaluation of students' ability to fit a bridle.
A. Illustrate - the making of a lunge line from a length of rope. B. Demonstrate - use of a training whip. C. Supervised practice	A. Note the illustrations and demonstrations B. Attach lunge line to lunge bridle C. Make different types of lunge lines. D. Use a lunge line with an open bridle.	A. Teachers' evaluation of students'preparation of the different lunge lines. B. Teachers' evaluation of students' ability to work the horse with lunge lines.
A. Prepare illustration of use of side lines on the bitting harness. (pp 122-126) Care and Training of Trotters and Pacers B. Supervised practice.	A. Note teachers' illustration. B. Attach lunge lines C. Work horse in long lines at the walk and trot in both directions with both types of bridle.	A. Teachers' evaluation of students' ability to attach lunge lines and work the horse.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Driving Harness and Hitching Objective #5 Identify all the parts and functions of a driving harness.	A. Parts of harness . Driving Harness . Blind bridle shadow roll - Page 46--461 - Ch. 8 ** . Bucking strap . Hobbles . Crupper . Belly band . Check lines
Objective #6 Adjust and properly fit a harness to a horse.	A. Use of whole harness B. Approach to horse C. Adjustments
Objective #7 Hitch the harnessed horse to an appropriate two wheeled training vehicle.	A. Two wheeled driving cart - Ch. 16 - pg. 640-641 *

01.01010103-02 - Code

HARNESS TRAINING OF HORSES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion of parts and functions of harness B. Use wall charts - of a harness Ch. 16 Pg. 642* C. Supervised study of harness or model.	A. Note taking B. Participate in class discussion. C. Keep drawings or photos of harness in notebook.	A. Oral or written quiz - identify all parts of harness.
A. Demonstrate - proper fit and adjustment of a blind bridle, saddle and belly band, crupper, traces, check lines and shadow roll. Ch. 3 Pg. 126-139** B. Explain - safety factors of using a bucking strap - Pg. 459 Ch. 8 ** C. **Illustrate - proper adjustments of hobbles - Ch. 8** Pg. 490-491** D. Supervised practice on a gentle animal.	A. Practice fitting harness to the horse as demonstrated.	A. Teacher evaluation of students ability to approach and harness the horse.
A. Class discussion B. Demonstration of hitching the cart. C. Supervised practice.	A. Participate in discussion B. Practice hitching the horse to the cart.	A. Teacher evaluation of students ability to hitch the harnessed horse to the cart.

Code - 01.01010103-02

Title - HARNESS TRAINING OF HORSES

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Driving the Horse Objective # 8 Use the reins to guide the horse, and drive over a prescribed course.	A. The harnessed horse only B. Hitch to a two wheeled cart NOTE: When breaking a young horse to the cart for the first time, the outside wraps on the girth should be wrapped through the shaft holders. If the horse should throw himself, he can be released simply by unhooking the tugs and pulling the cart back and away. C. Review of safety procedures used when working with harnesses and harness horses. D. Gentle pat on horse's neck is a good reward for the horse when he performs well.

EDUCATION

01.01010103-02 - Code

HARNESS TRAINING OF HORSES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion . Review safety procedures . Review "Give and Take" theory of controlling a horse. . Review "Punishment and Reward" theory. Ch. 3 Pg 129-139** B. Illustrate proper mounting of a two wheeled vehicle. Ch. 12 Page 632-633** ** Care and Training of Trotters and Pacers C. For breaking a young horse the teacher should reinforce the need for two assistants	A. Safety Procedures . Assistant leads harnessed horse at the beginning . Driver will walk behind cart until student feels confident the horse will remain steady and will respond to commands (before entering cart.) . After the driver is in complete control the assistant will remove his lead line but must stay with his partner to give assistance whenever needed. . "Give and take theory" - the driver will pull the left rein and slightly release the right rein to make the horse turn to the left. Reverse procedure to make opposite turn. . "Punishment and Reward" - theory - . urge or persuade the horse to advance . apply back pressure on reins - punishment - to bring the horse to a halt or standing position. . release pressure on the horses mouth Reward - when the horse stops.	A. Teachers' evaluation of students' ability to perform driving the horse over a specifi area.

Code - 01.01010103-02

Title - HARNESS TRAINING OF HORSES

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Gaits and Speeds Objective #9 Make the horse perform at his gaits at different speeds, while using training equipment.	A. Hitch horse to two wheeled cart. B. Drive C. Jog NOTE: Some horses only have one gait, and it should be maintained.

EDUCATION

01.01010103-02 - Code

HARNESS TRAINING OF HORSES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Review safety procedures B. Review "Give and take" theory of controlling a horse. C. Review "Punishment and Reward" theory. Ch 3 Pg 129-139** D. Review proper mounting of a two wheeled vehicle.	Drive the hitched animal to an enclosed area - either indoor or outdoors. Jog the horse around the ring or track. A. If the horse is a racing breed, jog the horse clockwise around the track. . If the horse is of a pleasure or show breed, jog along the rail in a counter clockwise direction. B. Racing Breeds will be exercised in one direction to develop the animal's muscle structure and lung capacity. Control his animal to perform in a straight line. C. For pacers hobbles are used. D. The Pleasure and Show Breeds will be driven over a prescribed course (figure 8 both ways of the ring - along the rail as much as possible) E. The Pleasure or Show Breeds will be urged to maintain a trotting gait. F. Whenever necessary, use a whip to urge the horse to a greater speed. The horse will not be allowed to change his gait. The horse must only increase his speed at the present gait.	A. Oral or written quiz - List the safety procedure to be used for the hitching of a horse to and driving with a two wheeled cart. B. Orally or in writing, explain the "Give and Take" theory. C. Teacher evaluation of the students driving ability.

Code - 01.01010103-02

Title - HARNESS TRAINING OF HORSES

OBJECTIVES BY UNIT	CONTENT
Unit 6 - Way of Going Objective #10 Recognize through observations of the horse's leg movements, defects in the "Way of Going" of the horse.	A. Forging B. Interfering C. Winging D. Paddling E. Cross firing F. Timing of hoof beats

01.01010103-02 - Code

EDUCATION

HARNESS TRAINING OF HORSES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion of each item in content B. Illustration by - Wall Charts or Transparencies showing the different irregularities in the "Way of Going" of a harnessed horse. Ch. 6 in ** ** Care and Training of Trotters and Pacers C. Line demonstration D. Supervised practice.	A. Listen to the hoof beat for uneven beats. B. Observe the horse's "way of going" from the side to locate any irregularities. C. Change places with the assistant to see the horse's movement from both angles.	A. Teachers' evaluation of students ability to detect defects in "Way of Going".

MODULE OF INSTRUCTION

Title - HARNESS TRAINING OF HORSES Code - 01.01010103-02

RESOURCE MATERIALS

BOOKS - Care and Training of the Trotter and Pacer

by - James C. Harrison
Published by the United States Trotting Association
750 Michigan Avenue
Columbus, Ohio 45215

Horses and Horsemanship

by - E. M. Ensmivger
Published by the Interstate Printers and Publishing, Inc.
Danville, Illinois 61832

MODULE OF INSTRUCTION

Title - CARE OF TACK AND EQUIPMENT

Code - 01.01010103-03

DESCRIPTION:

Tack and equipment condition is second only to the condition of the horse. Its importance, therefore, can not be over emphasized. In this module the student will be involved with the essential phases of tack and equipment conditioning. The student will demonstrate an ability to correctly clean and store tack and equipment. This process will involve the student in "learning by doing."

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Cleaning supplies	2	0
2. Cleaning tack	0	18
3. Cleaning of equipment	0	6
4. Storage of tack and equipment	2	2
	4	26

Revised August, 1975

MODULE OF INSTRUCTION

Title - CARE OF TACK AND EQUIPMENT

Code - 01.01010103-03

OBJECTIVES to be obtained:

The student will be able to:

1. Identify 11 pieces of tack and equipment.

2. Identify 14 articles needed for cleaning tack and equipment.

3. Demonstrate methods of removing dirt from pieces of tack by using specific cleaning agents that are offered by the instructor.

4. Identify and demonstrate use of preventives that will increase the use of tack and equipment.

5. Contrast correct with incorrect methods of storing equipment and tack. List methods of correctly storing 5 pieces of tack.

Code - 01.01010103-03

AGRICULTURAL

Title - CARE OF TACK AND EQUIPMENT

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Cleaning supplies Objective 1 Identify 11 pieces of tack and equipment.	A. Articles . Bitting harness . Driving harness . Bridles . Halters . Saddles . Girths . Stirrups and straps . Bits . Training boots . Hobbles . Reins
Objective 2 Identify 14 articles needed for cleaning tack and equipment.	A. Equipment and material needed . Harness rack or hook . Bridle peg . Saddle rack . Sponges . Chamois cloth . Cheese cloth . Flannel rags . Saddle soap . Glycerine soap . Neatsfoot oil . Metal polish . Petroleum jelly . Pails . Towels

EDUCATION

01.01010103-03 - Code

CARE OF TACK AND EQUIPMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and class discussion introducing students to the articles which need cleaning	A. List each article of tack used which needs care. . Note the characteristics of each for further identity	A. Written or oral test to identify each of 10 articles of tack or equipment which may need to be cleaned.
A. Instructor will introduce the articles used in the cleaning, preserving and polishing of harnesses, saddles and training equipment B. The instructor will list the order of preference of use in the cleaning of leather goods, metal articles and training vehicles. C. Demonstrate washing of leather articles. D. Refer to page 643-648 of Horses and Horsemanship, by Ensminger	A. List each material and substance for cleaning tack. Note the smells and textures of these new materials. B. List a use for each material. C. Disassemble and wash all leather articles.	A. Written or oral test identifying each of 12 materials and a use of each.

Code - 01.01010103-03

Title - CARE OF TACK AND EQUIPMENT

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Cleaning Tack Objective 3 Demonstrate methods of removing dirt from pieces of tack by using specific cleaning agents that are offered by the instructor	A. Equipment to be washed . Harnesses . Training cart . Pleasure driving cart . Sulkys . Fine harness buggy . Viceroy
Unit 3 - Cleaning of equipment Objective 4 Identify and demonstrate use of preservatives which will increase the use of tack and equipment.	A. Equipment to be cleaned . Training cart . Pleasure driving cart . Sulkys . Fine harness buggy . Viceroy . Harnesses

01.01010103-03 - Code

CARE OF TACK AND EQUIPMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate technique of washing	A. List the equipment which will need washing B. Practice washing each piece of equipment as instructed	A. Teacher evaluation of list B. Teacher evaluation of student progress in producing a piece of tack or equipment which is free from sweat and grime that has evidence of a preservative added to it.
A. Instructor will introduce and demonstrate each article used in the cleaning, preserving and polishing of harnesses, saddles and training equipment. B. Supervised practice C. The instructor will list the order of preference of use in the cleaning of leather goods, metal articles and training vehicles. Refer to page 643-648 of, Horses and Horsemanship, by Ensminger.	A. Compile a list of the preferred order of equipment to be cleaned and preserved, noting how often. B. Practice applying preservatives as instructed.	A. Teacher evaluation of list. B. Teacher evaluation of students completed job of cleaning and preserving an assigned article.

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Storage of tack and equipment Objective 5 Contrast correct with incorrect methods of storing equipment and tack. List methods of correctly storing five pieces of tack.	A. Tack room . Size . Ventilation . Neatness B. Hanging racks . Size . Placing . Use C. Shelter for driving . Vehicles

CARE OF TACK AND EQUIPMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and supervised study from pp 648 of, Horse and Horsemanship B. Demonstrate correct methods of storing each piece of tack and equipment C. Supervised practice D. Class discussion of need for and shelter for vehicles	A. Note taking B. Copy list of methods for storage of tack and equipment from, Horse and Horsemanship. C. Practice organizing tack and equipment D. Following the cleaning, preserving,polishing and greasing of all tack and equipment the students will store each article in its appropriate storage in the tack room or storage shed.	A. Oral or written test List 7 incorrect methods of storing 7 different pieces of tack or equipment. B. Teacher evaluation of student work with equipment storage.

MODULE OF INSTRUCTION

Title - CARE OF TACK AND EQUIPMENT Code - 01.01010103-03

RESOURCE MATERIALS

A. Books - Horses and Horsemanship
Dr. M.E. Ensminger
Fourth Edition
The Interstate Printers and Publishers Inc.
Danville, Illinois

B. Bulletins -

MODULE OF INSTRUCTION

Title - CARE OF FEET AND LEGS

Code - 01.01010103-04

DESCRIPTION:

The student will spend much of the time analyzing the most important part of the horse's anatomy - his legs. The student will view horses in order to gain experience in determining what causes horses to become lame and to interfere with its own movements. The predisposition of the common unsoundnesses and what can be done to correct these conditions will be studied.

The wrapping of legs with bandages will be stressed as well as aid to healthy hoof growth.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Anatomy and nomenclature of the hoof	2	8
2. Abnormal Posture		4
3. Hoof Trimming	2	10
4. Lameness and unsoundness	2	
5. Wrapping Legs		2
	6	24

Revised June, 1974

MODULE OF INSTRUCTION

Title - CARE OF FEET AND LEGS

Code - 01.01010103-04

OBJECTIVES to be obtained:

The student will be able to:

1. List the major bones and muscles of the front feet and legs of a horse.
2. List the major bones and muscles of the hind feet and legs of a horse.
3. Name the parts of the foot as viewed from the side and bottom while using an illustration or chart.
4. List abnormal standing positions of a horse's front and hind legs.
5. Recognize the different "ways of going" that need to be corrected by means of corrective shoeing.
6. Demonstrate the proper techniques of trimming a horse's hoof.
7. List the causes of lameness and unsoundnesses of horses' legs and hooves.
8. Illustrate hoof abnormalities.
9. Demonstrate the proper procedure for wrapping a horse's leg.
10. Demonstrate the proper method of applying hoof conditioners when given commercial conditioners and materials needed.

01.01010103-04

Title - CARE OF FEET AND LEGS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Anatomy and nomenclature of the hoof Objective #1 List the major bones and muscles of the front feet and legs of a horse.	A. Bones . Scapula . Humerus . Elbow . Ulna . Radius . Pisiform . Two rows of carpal (knee) bones . Splint bones . Cannon . Sesamoids . First phalanx (long pastern) . Second phalanx (short pastern) . Pedal or coffin bone B. Muscles . Deltoid . Caput magnum . Caput medium . Anterior pectoral . Extensor metacarpi magnus . Extensor pedis . Extensor sufraginis . Tendon extensor (metacarpi magnus) . Tendon extensor pedis . Flexor metacarpi . Ligament
Objective #2 List the major bones and muscles of the hind feet and legs of a horse.	A. Bones . Pelvis . Femur . Patella . Fibula . Tibia . Point of hock . Tarsals . Splint bones . Cannon . Sesamoids . First phalanx (long pastern) . Second phalanx (short pastern) . Pedal or Coffin bone B. Muscles . Gluteus superficialis . Semitendinosus . Long vastus . Tensor fasciae 1 . Tensor fasciae 2 . Gastonemius . Peroneus . Perforans . Extensor pedis . Suspinsory ligament

EDUCATION 01.01010103-04 - Co

- Title

CARE OF FEET AND LEGS

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion using overhead transparencies or other charts of skeletal and muscular structure of the horse. B. Field trip to horse farm to observe animals and the interrelationship of the bones and muscles of legs. C. Supervised study. D. Prepare mimeo drawings of legs and muscles for handouts.	A. List the bones of the front leg. B. List the muscles of the front leg. C. Label the bones and muscles on a drawing. D. Store discovered information in a notebook.	A. Oral or written test: Given a drawing of the front leg of a horse, label at least ten different bones, and ten different muscles.
A. Supervised study. B. Use of transparencies or charts. C. Field trip to horse farms to observe the muscles of legs. D. Procure front and rear legs of a dead horse for student supervised study. E. Prepare a mimeographed drawing of the hind leg.	A. List the bones of the hind leg. B. List the muscles of the hind leg. C. Relate bones to muscular functions. D. Touch and feel the muscles of a live horse. E. Study the bone structured example of a deceased horse. F. Store pictures and information in a notebook.	B. Oral or written test on identification of no fewer than ten bones and ten muscles of the hind leg.

Title - CARE OF FEET AND LEGS

OBJECTIVES BY UNIT	CONTENT
Objective #3 Name the parts of the foot as viewed from the side and bottom while using an illustration or chart.	A. Classes of structure . Bones . Elastic . Sensitive . Horney B. The Foot . Cannon bone . Long pastern . Short pastern . Coffin bone . Naricular bone . Fetlock joint . Coffin joint . Pastern joint . Extensor tendon . Deep flexor tendon . Perioplic ring . Coronary band . Plantan cushion . Sensitive frog . Horney frog . Periople . Sensitive sole . Horney sole . Sensitive laminae . Horney wall . White line . Ergant C. The Hoof . Frog . Heel . Bar . Sole . White line . Wall . Toe . Quarter . Heel

01.01010103-04

Title - CARE OF FEET AND LEGS

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Abnormal Posture Objective #4 List abnormal standing positions of a horse's front and hind legs.	A. Front legs . Good . Buck kneed . Calf kneed B. Front or hind legs . Tied in at the knee . Round bone . Short straight pastern . Coon-footed . Too long cannon
Unit 3 - Hoof Trimming Objective #5 Recognize the different "ways of going" that need to be corrected by means of corrective shoeing.	A. Ways of Going . Low strides . Head movements . Strides far . High gaited B. Methods of shoeing C. Types of shoes
Objective #6 Demonstrate the proper techniques of trimming a horses' hoof.	A. Equipment . Farmers' apron . Hoof pick . Hoof knife . Rasp . Calipers . Foot level B. Picking up foot

01.01010103-04 - Code

CARE OF FEET AND LEGS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discussion with illustrations of each form of normal and abnormal posture. B. Field trip to horse farm to demonstrate methods of viewing and detecting abnormalities.	A. List different abnormalities. B. Keep a picture or drawing file of each in a notebook. C. Observe and study the abnormal leg positions as directed by the teacher. D. Observe each horse from all angles while the animal is standing squarely on all four legs. Students list as many faults as are visible. The procedure should be repeated as many times as class time allows.	A. Instructors' evaluation of student identification of abnormalities of five different abnormalities in live situations.
A. Supervised study. B. Supervised experience. C. Field trip D. Demonstration E. Resource Person - Blacksmith	A. Note the acceptable and unacceptable ways of going. B. List methods of correcting each unacceptable way of going.	A. Teacher evaluation of student recognition of four ways of going.
A. Demonstrate the use for the Farrier's tools, proper procedure for picking up and holding horses' legs. B. Supervised practice. C. Resource person - Blacksmith	A. Observe techniques of picking up feet and smoothing feet. B. Practice the demonstrated techniques.	A. Teacher evaluation of student demonstrated techniques.

EDUCATION

01.01010103-04 - Code

CARE OF FEET AND LEGS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion concerning classes of structures. B. Supervised study of the foot . Use of references . Use of examples live and preserved C. Use foot of procured bones of deceased horse.	A. Questions pertaining to classes of structure. B. Sketch and label horses foot. C. Identify all parts of the foot. D. Identify parts of the horse's hoof, note which are sensitive and which are not.	A. Oral or written test, listing no fewer than 15 parts of the foot, and noting which are sensitive. B. Sketch and label the hoof of a horse showing no fewer than seven parts.

Title - CARE OF FEET AND LEGS

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Lameness and Unsoundness Objective #7 List the causes of lameness and unsoundnesses of horses' legs and hooves.	. A. Types of unsoundnesses . Blood spavin . Bog spavin . Bone spavin . Bowed tendon . Bucked shins . Calf kneed . Capped hock . Cocked ankles . Contracted feet . Corns . Curb . Founder . Fractured fibula . Gravel . Knee sprung . Navicular disease . Osselets . Popped knee . Quarter crack . Quittor . Ringbone . Scratches . Sesamoid fractures . Shoe boil . Side bones . Splints . Stifled . Stringhalt . Supensory ligament sprain . Thorougheim . Thrust . Sind puffs
Objective #8 Illustrate hoof abnormalities	A. Examples . Founder . Dropped sole . Quarter crack . Seedy toe

01.01010103-04 - Code

CARE OF FEET AND LEGS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and illustrated talk. B. Use of resource person (Veterinarian) C. Field trip to College of Veterinary Medicine; explore examples of these unsoundness D. Supervised study in small groups. Let each group research causes, symptoms and controls for an equal number of types, and prepare a report for the rest of the class.	A. Compile a list of the unsoundnesses explained and note the differences. B. Prepare questions to be answered by resource persons. C. List causes, symptoms, and controls of each unsoundness condition.	A. Teacher evaluation of prepared list of causes, symptoms and controls. B. Oral or written test of ten types of unsoundnesses complete with causes, symptoms and controls.
A. Class discussion B. Use of photos - animal with the abnormality C. Field trip to a farm or college of Veterinary Medicine to observe E. Problem solving.	A. Observation of abnormality. B. Collect photographs or prepare sketches of the abnormalities. C. Maintain a notebook D. Offer possible solutions.	A. Teachers' evaluation of the students' ability to identify the abnormality.

01.01010103-04

Title - CARE OF FEET AND LEGS

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Wrapping Legs Objective #9 Demonstrate the proper procedure for wrapping a horse's leg.	A. Materials needed for wraps . Cotton . Foam Rubber . Quilting . Bandages - 6" wide - 3 yards long
Objective #10 Demonstrate the proper method of applying hoof conditioners when given commercial conditioners and materials needed.	A. Hoof conditioners

EDUCATION

01.01010103-04 - Code

CARE OF FEET AND LEGS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study C. Instructor duplicate fig 94 pg 687 and review pg 686-687 of Care and Training of the Trotter and Pacer. D. Instructor will demonstrate and explain the difference between a leg wrapped for a horse standing in a stall and a horse being prepared for shipping. E. Supervised practice.	A. Note taking B. Study C. Practice wrapping following the demonstrated procedure.	A. Instructors evaluation of student application.
A. Demonstration B. Supervised Practice	A. Practice applying conditioners.	A. Instructors evaluation of student application.

MODULE OF INSTRUCTION

Title - CARE OF FEET AND LEGS

Code - 01.01010103-04

RESOURCE MATERIALS

Books - Care and Training of the Trotter and Pacer
The United States Trotting Association
750 Michigan Avenue
Columbus, Ohio 43216

Horse Science Handbook - 1963
Dr. M. E. Ensminger
Clovis, California 93612

Horse Science Handbook - 1964
Dr. M. E. Ensminger
Clovis, California 93612

Horse Science Handbook - Volume 3
Dr. M. E. Ensminger
Clovis, California 93612

Periodicals - The Western Horseman

MODULE OF INSTRUCTION

Title - SWINE PRODUCTION

Code - 01.01010104-01

DESCRIPTION:

The student will study the areas of feeding, breeding, disease control, and management specific to swine production.

The student will visit commercial swine operations to familiarize himself with the modern commercial operations.

It is further suggested that in those areas where swine enterprises are of greater importance, several modules be developed covering such areas as feeding, breeding, swine health, marketing and management.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Selecting for Swine Herd	3	5
2. Feeding the Swine Herd	6	2
3. Swine Disease and Parasites	5	3
4. Record Keeping and Registration	2	1
5. Swine Management	1	2
	17	13

Revised August '75

MODULE OF INSTRUCTION

Title - SWINE PRODUCTION

Code - 01.01010104-01

Objectives to be obtained:

The student will be able to:

1. Identify from illustrations or observation of live animals eight of the common recognized breeds or crosses of swine.
2. List the purposes for those breeds common to the local geographical area.
3. Correctly identify an animal using terms of the industry.
4. Determine the market demand for quality animals, by comparing cost factors of raising animals with market value, using no fewer than three different markets.
5. Select 5 foundation hogs that will produce progeny to meet the market demand for a high quality animal, using techniques and growth records, when given the illustrations and records of 10 animals.
6. Determine the nutritive needs of the various age classes of swine, include market fattening.
7. Plan feeding rations that will meet nutritive needs for each age class of swine.
8. Demonstrate to instructors satisfaction a working knowledge of the causes, symptoms (age affected), treatment, control and prevention of at least 15 diseases, conditions and stresses of economic importance in the state or area.
9. Outline a planned disease prevention and sanitation program for the swine herd.
10. Develop and maintain necessary health, breeding and reproduction records of a given swine herd.
11. Accurately prepare registration and transfer papers for pure bred swine, when given the proper information and application blanks.
12. Accurately ear notch or tatoo swine for permanent identification purposes with method accepted by breed association.
13. Plan a housing system and equipment needs for a given swine herd based on an approved management system.
14. Develop a complete program for raising swine by selecting and organizing information discussed and studies in the first 12 objectives.

Code - 01.01010104-01

Title - SWINE PRODUCTION

OBJECTIVES BY UNIT	CONTENT

Unit 1 - Selecting for swine herd.
Objective 1
Identify from illustrations or observation of live animals eight of the common recognized breeds or crosses of swine.
	A. Identification of the breeds of swine
	. Types of swine
	  . bacon
	  . lard
	  . meat
	. Popularity
	. Origin
	. Color
	. Distinctive head characteristics
	. Other distinguishing characteristics
	  . disposition
	  . litter size
	  . grazing ability
	  . rate of gain
	  . market quality

Objective 2
List the purposes for those breeds common to the local geographical area.
	A. Effects of cross breeding
	. Crosses common to area
	. Purposes of the cross
	. Results of the cross
	  . color - characteristics
	  . physical changes as compared to parents
	  . other distinguishing characteristics
	    . disposition
	    . litter size
	    . rate of gain
	    . market quality

Objective 3
Correctly identify an animal using terms of the industry.
	A. Terms to be included
	. Sex and age of animal/market terms
	  . barrow
	  . gilt
	  . sow
	  . boar
	  . shoot
	  . pig
	  . hog
	  . stag

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Chalkboard presentation of breeds of swine and their characteristics - coupled with color slides or film strip of animals of the breed. B. Supervised study of texts of the types and breeds of swine.	A. Make a chart indicating the means of identification of hogs. B. Prepare oral reports on breeds of swine.	A. Oral or written test. . Picture identification. . Characteristics of the various breeds and/or crosses.
A. Supervised study - oral reports on breeds by students covering the same information. B. Supervised study - students prepare, and send a letter requesting general information concerning a specific breed of hogs, source of breeding stock in the area and information on requirements for registration and transfer.	A. Letter preparation and sending for use in the report.	A. Instructor's evaluation of the written letter.
A. Lecture and discussion using chalkboard to identify terms.	[illegible]. Prepare a list of terms used in the swine industry.	A. Written quiz - term identification

OBJECTIVES BY UNIT	CONTENT
Unit 1 continued Objective 4 Determine the market demand for quality animals, by comparing cost factors of raising animals with market value, using, no fewer than three different markets.	A. Market demand for swine . Market classes . hog and pigs . use selection . sex . weight . color . Seasonal conditions . cycle of high and low . highs . June-August - gilts and barrows . February-March - sows . August-September - sows . lows . November-May - gilts and barrows . April and October - sows . day of week . Monday high receipts . local variations . Other local factors and conditions . holidays - Easter, Christmas . demand for special types as roasters

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Chalkboard lecture discussion of general marketing patterns showing long range hog cycling in numbers to prices & yearly variations in numbers and prices. (If market has a weekly cycle indicate this unless there is a single day hog market) - Overlays or prepared charts are useful here.	A. Preparation of graphs or charts showing the cycles of hogs production, marketing producers and prices received.	A. Written test
B. Assigned reading from text - *Swine Science* or *Animal Science*. Marketing and slaughtering of hogs.	B. Notes taken on field trip to determine the local demands for market hog quality.	B. Written report of the local market requirements and conditions to the satisfaction of the instructor.
C. Field trips to local market center to talk with buyer in terms of the desire at that market for quality animals. Prices to be expected at various seasons and supply of animals passing through the yard. This can also be done by a visit to a commercial producer where he discusses the marketing situation as he sees it.		

Code - 01.01010104-01

Title - SWINE PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 1 continued Objective 5 Select 5 foundation hogs that will produce progeny to meet the market demand for a high quality animal, using judging techniques and growth records, when given illustrations and records of 10 animals.	A. Review basic genetics of inheritance. . Measureable characteristics . carcass length . back fat thickness . leg length . weaning weight . birth weight . Inherited undesirables . umbilical hernia . scrotal hernia . inherited or blind nipples . cryptor chidism . fetals . Type inheritance . strong and weak points in animals . length and depth of body . feet and legs . shoulders . rump . hams . smoothness and blushing of all parts . conformation and breed type

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion of basic genetics as it is applied to swine, emphasis on multiple gene factors. . Stress those characteristics that have been identified as measurable and demonstrate through problems how this should work on paper. . Stress importance of selecting animals that are free of lethals and free of undersirable traits that are not fully identified as to type of heredity. . Students are to recognize that this will not always work out as planned as much is not known of inheritance.	A. Problem solving of genetic situations showing inheritance factors, lethals, sex, color, growth and size.	A. Written quiz - identification of parts of the hog and desirable traits of the meat hog.
B. Field trip - visit herd when sows have recently farrowed and evaluate animals in terms of their type. . Compare the litter to the sows and boar.	B. Examination of boars, sows and litters to observe inherited factors.	B. Written or oral test of the grading procedures and evaluation of types to carcass values.
C. Supervised study of selection by type and confirmation as well as swine genetics (Swine Science has excellent chapters on breeding and selection. . Overhead chart and/or ditto of parts of the hog and desirable characteristics of meat type hog as well as common faults. If equipment is available demonstrate.	C. Select pigs from litter that demonstrate desired type and weight for age at time of the visit.	C. Written test. Problem solving of mechanics of inheritance. Solve at least 5 problems demonstrating understanding of principles of inheritance.
D. Field trip to commercial hog producers for: backfat probe demonstration coordinated with extension personnel for a demonstration for use of ultra sonic equipment, if such equipment is available.	D. Supervised study of text assignments and ditto sheets of hog parts and characteristics.	D. Selecting individual gilts from litter for breeding stock on the basis of observation of sow, bear and gilts, to instructors satisfaction.
E. Field trip to slaughter house for carcass evaluation. It is suggested if possible, to follow up the use backfat probe and ultra sonic equipment for visual evaluation of some of the same animals.	E. Observation and participation in the use of the equipment. Grading of carcasses according to the USDA standards.	

OBJECTIVES BY UNIT	CONTENT
Unit 1 continued Objective 5 continued	Selection based on pedigree . terms . reading . shows . progeny results . filter . evaluation of animal . boar . gilt Selection on the basis of breeders . reputation . honesty . breeding program . progress in management . prices and condition
Unit 2 - Feeding the swine herd Objective 6 Determine the nutritive needs of the various age classes of swine.	A. Age classes of swine . Birth through weaning . Feeder . Reproducing herd B. Specific needs of various classes of swine . Protein . Energy . Mineral needs . Vitamins . Water . Feed additives

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
F. Supervised study. Borrow pedigrees from local farmers of quality stock and reproduce for study. G. Interview a local breeder for his evaluation of several pedigrees for strong points to look for in and what to avoid in the pedigree. H. Supervised study on the basis of the previous materials and visits to area farms. Students should have gained an idea of the individual breeds, his breeding program and management of his stock. From this based on lecture-discussion of traits to look for, students should be able to select the source of their breeding stock.	F. Study of pedigrees for selecting boars and gilts. G. Practice writing a pedigree using animals from several pedigrees as parents. H. Select a boar or gilt by use of pedigree. I. Preparation of a written report of the procedure they plan to follow in the selection of breeding stock for the swine herd.	E. Instructor evaluate pedigree written for practice. F. Select a boar or gilt on the basis of pedigree evaluation to the instructor's satisfaction. Evaluation by instructor of written plan.
A. Lecture - discussion of the needs of the classes of stock. B. Supervised study using chapter XXXVI, Animal Science Chapter VI, Swine Science, Chapter 4 Raising Swine Chapters XXXIV and XXXV and appendixes tables Morrison's Feeds and Feeding.	A. List and illustrate the age classes of swine. B. Students make charts showing nutritional needs of various classes of swine.	A. Written quiz of importance of various nutritional material

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Title - SWINE PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 2 continued Objective 7 Plan feeding rations that will meet nutritive needs for each class of swine.	A. Study of breed materials available and complete feeds in terms of: . Protein . Energy . Vitamins . Minerals . Limiting factors B. Feeding programs to be developed for . Bred gilts and sows . Nursing sows . Growing pigs . Finishing hogs . Herd boars
Unit 3 - Swine disease and parasites Objective 8 Demonstrate to instructors satisfaction a working knowledge of the causes, symptoms (age affected), treatment, control and prevention of at least 15 diseases, conditions and stresses of economic importance in the state or area.	Disease stress or conditions that are to be considered, including: A. Infectious diseases . Hog cholera . Erysipelas . TGE (transmissible gastro-enteritis) . Brucellosis . Leptosperosis . VPP (virus pig pneumonia) . AR (antrophic rhinitis) . T.B. . Anthrax . H.S. (shipping fever) . Vescicular exanthema . Vibronic dysentary . Necrotic enteritis B. Nutritional disease: . Baby pig anemia . Parakeratosis . Rickets . B-vitamin deficiencies . Trace mineral deficiencies C. Parasites: . Internal . External

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion of ration development. B. Supervised study of feed materials using texts above. C. Let students procure a list of feed materials available. D. Individual instruction in ration development for the various classes of swine. E. Comparison of rations developed with suggested rations from texts. F. Determination of the cost of rations. G. Field trip to farm for observation and information in regards to sound feeding programs for various classes of swine.	A. Determine feed materials available from local farms and mills. B. Identification of various feed materials. C. Chart of feeding values for those feeds available for feeding purposes. D. Develop rations for each age class of swine in given situation. E. Determine cost of ration with idea of least cost ration that meets nutritional needs.	Teacher evaluation of: A. Chart of materials and feeding values. B. Visual identification of ingredient feeds (80% accuracy). C. Problem to determine cost of a ration. D. Written test - given a specific age class and a Feeds and Feeding text, develop a mixed ration.
A. Lecture and discussion of need for disease information. B. Supervised study using references. C. Preparation of disease information sheets. D. Slide and/or tapes and filmstrips of specific diseases. E. Resource person, area veterinarian on disease common to the area with his recommendations for treatment and control. F. Field trip to area farms to observe the sanitation and precaution practices followed by modern operations. G. Demonstration handling of hogs to take temperature, respiration and pulse rate. H. Demonstration of method used to handle hogs for treatment I. Discussion of ways to reduce stress on the swine herd at various times of the year through sound management practices.	A. Student compile notebook material containing specific information of the cause, symptom, age affected, treatment control and prevention of each disease studied. B. Report on sanitation measures used on area farm for disease prevention and controls. C. Demonstrate handling hogs for temperature, respiration, pulse and general handling of sick hogs. D. Notes taken on the basis of the group discussion.	A. Teacher evaluation of student notebook, for content completeness and accuracy on each disease studied. B. Written test - List causes, symptoms, and control of 10 swine diseases. C. Ability to take temperature, respiration rate and pulse of animal accurately. D. Ability to recognize stress in animals with 80% accuracy and reduce the condition.

OBJECTIVES BY UNIT	CONTENT
Unit 3 continued Objective 9 A Planned disease prevention and sanitation program for the swine herd.	A. Review disease prevention from above.
Unit 4 - Record keeping and registration Objective 10 Develop and maintain necessary health, breeding and reproduction records of a given swine herd.	A. Record keeping requirements . Those needed . Simple in form for use . Permanent in nature B. Litter record keeping . Group information . Individual information C. Individual sow record showing . Identity . Production record . Health record
Objective 11 Accurately prepare registration and transfer papers for pure bred swine, when given the proper information, and application blank.	A. Review information received from Unit 1 when letter was sent to breed association for information regarding breed. . Requirements for registration . Preparation of necessary forms
Objective 12 Accurately ear notch or tatoo swine for permanent identification purposes with method accepted by breed association.	A. Information provided by breed association . Ear notching . Tatooing

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Develop prevention program for parasite control through supervised study and tape discussion with local farmer and for area veterinarian. B. Individual instruction.	A. Preparation of disease prevention and sanitation report.	A. Teacher evaluation of student report on sanitation and disease prevention.
A. Supervised study of various record keeping forms dealing with the swine herd as given in Swine Science pgs. 127-130 or Raising Swine pgs. 94-95. B. Individual or group development of necessary records to meet criteria given. C. Supervised practice using sample problems record keeping for the swine herd, using individual and group instruction.	A. Development of record forms. B. Practice problems.	A. Teacher evaluation of preparation of necessary forms. B. Teacher evaluation of ability to keep necessary records through practical exam of record keeping.
A. Individual instruction in the preparation of registration and transfer papers. B. Borrow registration and herd book from a farmer for group to examine.	A. Prepare sample registration forms, carefully and accurately.	A. Teacher evaluation of accurate, complete preparation of registration and transfer papers of purebred hogs.
A. Use chalkboard and previously prepared cardboard ears for demonstration. B. Demonstrate correct techniques for tatooing or ear notching of animals for permanent identification, on live animals. C. Supervised practice.	A. Student practice of ear notching using cardboard. B. Develop ability to "read" information given by other students. C. Practice on live hogs.	Teacher evaluation: A. Ability to tatoo and ear notch live animals. B. Ability to "read" ear notch.

Code - 01.01010104-01

Title - SWINE PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Swine Management Objective 13 Plan housing system and equipment needs for the swine herd based on an approved management system.	A. Systems available . Pasture system - individual house . Combination system . Complete confinement system B. Advantages and disadvantages of each system in terms of - . Type of feed facilities . Manure handling . Land available . Controlled environment . Investment in buildings and equipment C. Equipment needs - . Breeding crates . Creeps . Heat lamps . Farrowing crates . Loading chutes . Self feeders . Shade . Watering system . Cooling systems . Fencing . Lighting D. Space requirements for animals
Objective 14 Develop complete program for raising swine by selecting and organizing information discussed and studied in the first 12 objectives.	A. Selecting the animals for the herd. . Number and age class of stock B. Plan a complete feeding program . Estimate of feeds needed for the year by each class. . Determine costs for the feeding program C. Demonstrate the sanitation and disease control program. D. Records needed for operation. E. Housing requirements for the herd.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion of housing system and equipment. B. Supervised study Chapter X Swine Science and Successful Farming magazine articles C. Field trip to area farms to observe housing systems and talk with owner about advantages, problems and desired changes for the future for his situation. D. Supervised study - student individual planning for a swine herd housing system by making floor plan drawing of set of facilities. E. Oral presentation of developed system before class for evaluation.	A. Note taking on lecture and the supervised study program. B. List observations made while on the field trip to area farm. C. Preparation of floor plan for swine facility that reflects careful consideration of various programs. D. Oral presentation to class for evaluation.	A. Teacher evaluation of floor plan. B. Class evaluation of the housing program presented.
A. Individual instruction of students working on the planned program for the swine herd.	A. Preparation of the final plan.	A. Teacher evaluation of final plan.

MODULE OF INSTRUCTION

Title - SWINE PRODUCTION Code - 01.01010104-01

RESOURCE MATERIALS

A. Books -

*Swine Production, 4th Edition, M.E. Ensminger; Interstate Publishers
*Animal Science, 6th Edition, M.E. Ensminger, Interstate Publishers
*Stockman's Handbook, M.E. Ensminger; Interstate Publishers
Raising Swine, F.P. Dayoe, J.L. Krider, McGraw Hill, 1952
Swine Production, W.E. Carroll, J.L. Krider, F.N. Andrew, McGraw Hill.1962
Swine Production, C.E. Dundy, R.V. Diggins, Prentice Hall Inc. 1956
Approved Practices in Swine Production, G.C.Cook, E.M. Juergenson, Interstate Publishers - 1962
Hoards Dairyman Feed Guide - Staff Fort Atkinson Wisconsin
Livestock Breeding, Ohio Agricultural Education Curriculum Materials Service
Veterinary Guide for Farmers, F.W. Stamm, Hawthorn Books, New York

* Ensminger's texts are all similar. Where Swine is a major enterprise his text Swine Production would be favored over the other two. Where Swine is of a minor importance Animal Science is favored, because the same text will cover the more important aspects and also covers all classes of livestock and poultry. Stockman's Handbook is more tabular and a "how to" form of presentation. Approved practices covers the material in a more sketchy manner but would be satisfactory for a minor emphasis module. It should not be used alone.

B. Bulletins - Successful Swine Production, E.C. Bull. Extension Bulletin 1045, IMS.

C. Periodicals - Hoards Dairyman - Fort Atkinson Wisconsin
Successful Farming Magazine
Farm Quarterly Magazine, Cincinnati

D. Audiovisuals -

MODULE OF INSTRUCTION

Title - SHEEP PRODUCTION Code - 01.01010105-01

DESCRIPTION:

The student will study the areas of selection, feeding, breeding, disease control, management, housing and marketing of sheep.

Visits to area farms where different types of sheep operations are carried on will be made to familiarize the student with the approved practices of the industry.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Characteristics and type of sheep enterprises	1	1
2. Selecting stock	2	2
3. Breeding the farm flock	1	1
4. Feeding the farm flock	3	2
5. Disease and Health	4	2
6. Record keeping	1	
7. Housing requirements and equipment	1	1
8. Sheep management practices		2
9. Marketing products	3	3
	16	14

Revised June, 1974

MODULE OF INSTRUCTION

Title - SHEEP PRODUCTION Code - 01.01010105-01

OBJECTIVES to be obtained:

The student will:

1. Investigate the potential for a sheep enterprise in his area.
2. Identify 10 breeds of sheep as to characteristics and wool type and give the primary purpose for each breed as used in New York State.
3. Select the breed of sheep that will be profitable to the area.
4. Identify the 25 parts of the sheep from memory.
5. List 10 of the 17 factors to consider when selecting foundation animals and/or feeder lambs.
6. Plan a breeding management program for ewes and rams.
7. Plan a feeding program for commercial flock, lambs, purebred flock and rams.
8. Demonstrate a working knowledge of the cause, symptoms, treatment control and prevention measures for 10 diseases or conditions that affect sheep.
9. Plan a disease and parasite control program for a sheep enterprise.
10. Develop and maintain necessary records for a sheep enterprise.
11. Develop a plan for housing and pasturing a flock of sheep for a given situation.
12. Assist in each of the following management techniques: castration, docking, tagging, foot trimming, dipping or spraying sheep.
13. Plan a marketing program for sheep under various situations and the marketing of the fleece.

Code - 01.01010105-01

Title - SHEEP PRODUCTION

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Characteristics and type of sheep enterprises Objective #1 Investigate the potential for a sheep enterprise in his area.	A. Factors that influence an enterprise . Climate and general weather . Topography . rough drier land . Market possibility . lamb crop . one or two crops per year . hot house . wool . purebred flock . Limited facilities necessary . housing requirement . equipment needs . labor requirements and distribution . Limited capital invested in animals . commercial ewes $10-30 . commercial young ewes $20-24 . purebred ewes $30-100 . rams - $75-100 . age . quality . year . Maintenance costs relatively low . $20 per head . Returns . $30 per head . Enterprise possibility . commercial ewe flock . purebred flock . feeder lamb . Individual requirements . interest and desire . shepherding ability

EDUCATION

01.01010105-01 - Code

SHEEP PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion using charts prepared from Cost - Accounts Farms examine the cost and return factors.	A. Note taking of factors involved in the success for this enterprise in the area.	A. Discussion and participation.
B. Study of local market possibility for prices received.	B. Preparation for panel discussion and questions.	B. Written or oral report of the potential for the area.
C. Examine the characteristics of the possible enterprise opportunities available in the area. References for above - Supervised study Cornell Bulletin #828 pages 3-8 Sheep Science Chapters I and II or Animal Science XXIII and XXIV	C. Written evaluation of field trip if used.	
D. Discuss individual requirements for success in the program.		
E. Panel discussion based on reference work above as to the possibility for success in enterprise in the area followed by a question-answer session.		
F. Visit to commercial farm flock and discuss with the owner about the possibility.		

Code - 01.01010105-01

Title - SHEEP PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Selecting Stock Objective #2 Identify 10 breeds of sheep as to characteristics and wool type and give the primary purpose for each breed as used in New York State.	A. Breeds of sheep common to the area . Cotswold *.Dorset . Southdown .Chevait . Shropshire *.Corriedale *. Hampshire .Rambouillet *. Suffolk . Delaine-Merino . Oxford *.Columbia *most common B. Types of sheep . Fine wool . Mutton type . medium wool . long wool . Other . carpet wool . fur type C. Place of origin D. Color - Face, legs, ears E. Head Characteristics F. Other distinguishing characteristics (If the instructor desires, he may list other breeds that produce wools or fur that are not of importance in New York from an interest stand point.)
Objective #3 Select the breed of sheep that will be profitable to the area.	A. Breed selection . Personal preference . Quality and quantity of efficient lamb production . Wool production . Breeds available in area
Objective #4 Identify the 25 parts of the sheep from memory.	A. Back B. Barrel C. Feet and legs D. Head E. Others listed on page 101 of Sheep Science

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Chart prepared or overlay giving the factors A-F in content. B. Film strip "Breeds of Sheep" NASCO. C. Slides or commercial films if available. D. Pictures (in color if possible) of ewes and rams. E. Supervised study of same references used in Unit #1.	A. Students make chart of breed information.	A. Test . Identify 10 of the breeds of sheep, by photos or slides.
A. Review letter writing. B. Supervised practice of preparation of a letter to a breed association of the individuals' choice requesting general information about the breed and the procedure used for registrations and transfers.	A. Prepare a brief report either written or oral and written on breed recommended for the area. B. Preparation of letter to be sent to breed association.	A. Teacher evaluation written report style and content. B. Teacher evaluation of written letter.
A. Ref. Parts of the sheep or an overlay prepared showing labeled parts of the sheep. With copy prepared on ditto (Page 101 - Sheep Science) B. Lecture - discussion C. Supervised study	A. Note taking B. Label the parts on the drawing.	A. Oral or written test. B. Identification of parts of sheep on drawing.

OBJECTIVES BY UNIT	CONTENT
Objective #5 List 10 of 17 factors to consider when selecting foundation animals and/or feeder lambs.	A. Factors to be considered . Uniformity of animals . Health . Age . Soundness of udder . Size . Adaptation . Pedigree (if purebred) . Rate of gain . Fleece quality and weight . Carcass quality . Evidence of multiple birth . Free of defects and abnormalities . Conformation . Mouth . Feet and legs . Availability . Price Some factors will vary in importance depending on the use intended of the animal.
Unit 3 - Breeding the farm flock Objective #6 Plan a breeding management program for ewes and rams.	A. Factors affecting reproduction . Estrus cycle of ewes . Day length - photoperiod . Temperature . Nutritional levels . Age of puberty and breeding . Conception methods - identification . Condition of the ram B. Preparation of stock for breeding . Ewes . Rams . Nutrition

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion of selection factors. B. Field trip to farm flock to select animals for different purposes - purebred stock - feeder lamb - commercial stock. Discuss with owner. C. Demonstration for handling sheep to include: . Catching and holding . Fleece examination . Conformation examination . Aging the animal by mouth D. Ditto sheet (Sheep Science - Page 109) Determing Age of Sheep by teeth. E. If in an area where there is a livestock sale-attend the sale either to purchase animals or to observe.	A. Note taking on selection factors with the instructor and on field trip with the owner. B. Examination of animals for - . Fleece . Conformation . Age C. Study ditto sheet on age by mouth. D. Select several animals from flock for practice.	A. Test oral or written - Name 10 factors to consider, when selecting foundation stock or feeder lamb. B. Teacher evaluation of students' ability to handle animals carefully. C. Teacher evaluation of students' ability to age animals. D. Teacher evaluation of students' ability to select live animals based on desired selection practices.
A. Lecture on reproduction of sheep with emphasis on heat period factors. B. Supervised study Sheep Science Chapter Vi especially pages 180-191. C. Field trip to farm flock to discuss with the owner the breeding program and management of the flock that he used. D. Discussion questions end of Chapter VI either as a written - oral exercise.	A. Note taking based on lecture and field trip. B. Discussion questions end of Chapter VI.	A. Teacher evaluation Written report of sound program for management of the flock at time of breeding.

Code - 01.01010105-01

Title - SHEEP PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Feeding the farm flock Objective #7 **Plan** a feeding program for commercial flock, lambs, purebred flock and rams.	A. Determine nutritional needs for animals . Protein need . Energy . Minerals . Vitamins . Water . Other ration ingredients B. Feeding materials . Roughages . Concentrates . Complete mixed rations C. Making least cost rations D. Parts to consider in feeding . Commercial Flock . during day period . during pregnancy . lactation . Lambs . early lambs . pasture period . dry lot fattening . complete roughage grain mixtures for fattening lambs . Purebred flock . as above for commercial but heavier . Rams . non-productive season . breeding season

EDUCATION 01.01010105-01 - Code

SHEEP PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion of the requirements of sheep for nutrition. B. Chart on board of requirements from Morrisons' Feeds and Feeding Table #3 on various situation's. C. Supervised readings from Morrison, Cornell Bulletin #828 and Sheep Science Chapter VII using work sheet. D. Study of feed materials available on local market for feeding and prices. E. Make sample rations that reflect least cost and will meet requirements of the various classes needs. F. Field trip to farm flock to observe feeding practices being followed, equipment used and management techniques in use. G. Discussion of feeding program with operator. H. Discussion of feeding and management problems with different enterprise goals. (Livestock Handbook for County Agents) including the feeding of additives. I. For one type of enterprise (commercial flock, fat lamb, or Purebred flock) plan a complete feeding program for a year or cycle.	A. Note taking during a lecture and observation and notes on field trip. B. Work sheet preparation. C. Making sample feed formula that meet requirements in various situations. D. Preparation of written report on enterprise feeding.	A. Oral or written test on nutritional needs and feeding materials. B. Teachers evaluation of feed formulation. C. Teachers evaluation of a feeding program. and plan for one type of sheep enterprise.

Code - 01.01010105-01

Title - SHEEP PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Disease and Health Objective #8 Demonstrate a working knowledge of the cause, symptoms, treatment control and prevention measures for 10 diseases or conditions that affect sheep.	A. Infectious Diseases . Sore mouth . Scrapic . Blue tongue . Eutrotoxomia . Vibriosis . Anthrax . Black leg . Rabies . Scours . Navel ills . Circling Disease . Entropion . Mastitis B. Parasites . External C. Internal conditions . Bloat
Objective #9 Plan a disease and parasite control program for a sheep enterprise.	General Program should include: A. Prevention measures from outside . Visitors . New stock . Fences B. Prevention measures from within . Barns and runs . Pasture . Feed and water troughs . Exercise . Dog control . Vaccination . Flock separation . Isolation of infected animals . Parasite controls . internal . external . Disposal of dead animals . Other management practices

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study and group discussion of diseases. B. Use of disease information sheets to fill information as outlined in the objective. C. Slides showing conditions. D. Charts and graphs of life cycles of parasites. E. Demonstration of determining temperature, respiration and pulse rate. F. References suggested include - 1956 Yearbook of Agriculture - Disease	A. Students compile notebook containing the work sheets.	Teacher evaluation of: A. Student notebook for content on each of the disease or condition studied. B. Oral or written test where at least 80% accuracy is required for disease symptom, treatment and controls.
A. Lecture - discussion of sanitation control program to be under taken. B. Field trip to farm flock or fat lamb situation to observe disease control and sanitation program. C. Discuss problem with operator or tape discussion and present in class. D. Tape interview with area veterinarian of correct disease control and sanitation measures to follow. E. Chapter Xi - Sheep Science as assigned reading. Discussion questions at end of chapter.	A. Notes taken on Program. B. Written answers to questions at end of Chapter XI - Sheep Science. C. Development of plan for control program.	Teacher evaluation of: A. Written plan for prevention and control program, in a given situation.

OBJECTIVES BY UNIT	CONTENT
Unit 6 - Record keeping Objective #10 Develop and maintain necessary records for a sheep enterprise.	Area to include - A. Those needed B. Useable form C. Permanent Form . Farm Flock Record . Registration Papers for Purebred sheep . Transfer Papers for Purebred sheep
Unit 7 - Housing requirements and equipment Objective #11 Develop a plan for housing and pasturing a flock of sheep for a given situation.	A. Buildings . Temperature . Humidity . Insulation and ventilation . Light . Water supply . Heat supply - lambing . Slotted floors . Space requirements . Manure disposal B. Equipment . Hay racks . Grain troughs . Self feeders . Mineral feeders . Watering facility . Cutting chutes . Dipping or spraying facility . Lambing pens . Lamb creep . Shade . Fences

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Review requirements for record keeping. B. Using sample situations have students develop flock records and/or use suggested record in reference. C. Borrow registration and transfer papers from breeder to use in class for discussion purposes. D. Supervised student practice filling in registration and tranfer papers.	A. Problem solving for record keeping. B. Fill in sample registrations or transfer.	A. Oral or written test - problem of a given situation.
A. Lecture - discussion of housing requirements. B. Supervised study Chapter X Sheep Science. C. Field trip to farm flock situation for housing and equipment used. D. Trade magazines of farm plans of equipment used in sheep enterprises. E. Develop a bill material for a facility or equipment item.	A. Develop drawing of sheep handling facilities and housing made for farm flock.	A. Teacher evaluation of student plan for facility.

OBJECTIVES BY UNIT	CONTENT
Unit 8 - Sheep management practices Objective #12 Assist in each of the following management techniques: castration, docking, tagging, foot trimming, dipping or spraying sheep.	A. Jobs: . Docking . Castration . Tagging . Foot trimming . Dipping or spraying B. Tools and equipment needed C. Technique used
Unit 9 - Marketing products Objective #13 Plan a marketing program for sheep under various situations and the marketing of the fleece.	A. Slaughter and feeder lambs - . Methods of marketing . lamb pools . auction markets . terminal market at Buffalo . other markets or buyers throughout state . Seasonal price trend . high market - May, June and July . low market - October, November and December B. Hot house Lamb - . Market . New York City . large city market - Buffalo - Albany etc. . Price trends . consistent market - December - May . supply can break price C. Purebred - . Consignment sales . New York State Sheep Improvement Project . Ithaca - July . New England Sheepbreeders . Northampton, Mass. . Keystone Stud Ram sale . Harrisburg, Penns. D. Wool Markets . Wool grower cooperative . Wayland, Albion, Auburn, New Berlin, Schaghticoke, Altamont.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion of handling animals vs. review. B. Demonstration of each of the management techniques by the owner of a farm flock. C. Supervised study assigned reading Chapter VIII - Sheep Science on management techniques.	A. Observation and assistance in the handling of animals for the demonstration.	A. Teacher evaluation of: Student participation in assisting and handling.
A. Lecture-discussion of marketing methods as applied in New York in location of various types of markets available. B. Using the livestock market report from the "Buffalo Evening News" have students plot the market numbers and prices over a period of time (Preferably on a using Market) making either bar or line graphs. C. Supervised study of Chapter XII-Sheep Science Dealing with market classes and grade for sheep and marketing patterns. D. Attend a sheep sale either at a livestock market as Caldonia or watch sales at the terminal market in Buffalo. E. Contact the buyer for a packing plant for a possible guest speaker in class or a tape interview on the topic of requirements for top quality animals. F. Discuss with local farmer his marketing procedure for lambs, ewes for slaughter.	A. Notes taken on lecture and on field trips. B. Graph construction of market conditions. C. Prepare a short report on the marketing of lambs or ewes as outlined in text. OR D. A short report on marketing procedure for fleece as outlined in the text.	Teacher Evaluation of: A. Graph preparation and analysis of market conditions. B. Prepared report - either oral and written or written. C. Group written report on situation assigned.

OBJECTIVES BY UNIT	CONTENT

EDUCATION

01.01010105-01 - Code

SHEEP PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
G. Lecture - discussion of characteristics of fleece and what is considered to be a quality fleece. H. Lecture - discussion of the steps in preparing the fleece for sale. I. Supervised study Chapter XIII - *Sheep Science*. . Dealing with fleece characteristics and quality fleece. J. Movie or slide film of shearing sheep or demonstration of shearing. K. Guest speaker from the wool marketing cooperative in the area on handling of fleece and the grading storage and sale of the fleece. L. Divide class into groups for preparation of a plan for marketing sheep under a situation assigned.	(Same as on previous sheet)	(Same as on previous sheet)

MODULE OF INSTRUCTION

Title - SHEEP PRODUCTION Code - 01.01010105-01

RESOURCE MATERIALS

A. Books - *Sheep and Wool Science, M.E. Ensminger, Interstate Publishers, Danville, Illinois.
Animal Science, M.E. Ensminger, Interstate Publishers, Danville, Ill.
Feeds and Feeding, F.B. Morrison, Morrison Publishing Co. Ithaca, N.Y.
Yearbook of Agriculture 1956 Disease, U.S. Printing Office, Washington, D.C.
Livestock Handbook for County Agents.

*In the module - The term "Sheep Science" is used for "Sheep and Wool Science"

B. Bulletins - Cornell Extension Bulletin #E828 Sheep Production.

C. Periodicals - Hoards Dairyman - Fort Atkinson, Wisconsin.

D. Audiovisuals - None

BREEDING:

:LIVESTOCK HANDBOOK FOR AGENTS
: Livestock Commodity Committee
:
: SECTION II, B-5

FARM FLOCK RECORD

Owner Name: ____________________ Address: ______________________________ Year of Report: ____________

Flock No: ____________________ Flock Size: ______________________________ Creep Code: ____________

EWE											LAMB													
Ewe No.	Birth Date			Wool					Br.	Regis. or Grade	Lamb No.	Birth Date			Bi. Wt.	Sex	Sire No.	Wean Date			Wean Wt.	Wean Gr.	Multi. Birth Code	Abnormality Code
					Date Shorn																			
	Mo.	Day	Yr.	Wt.	Mo.	Day	Yr.	Gr.				Mo.	Day	Yr.				Mo.	Day	Yr.				

MODULE OF INSTRUCTION

Title -POULTRY PRODUCTION

Code - 01.010106-01

DESCRIPTION:

This module will include an overview and general study of modern poultry housing, equipment and facilities, sanitation and health programs, feeding requirements for chicks, pullets, layers, and the marketing of eggs and poultry products. In depth information may be studied by referring to modules in Poultry Selection, Poultry Facilities, Poultry Health and Marketing and Poultry Management.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. The poultry industry	1	1
2. Selecting poultry breeds and strains	2	3
3. Housing facilities	3	3
4. Sanitation and health	3	3
5. Feeding programs	3	1
6. Poultry marketing	2	3
7. Management of a poultry enterprise	1	1
	15	15

Revised August 1975

MODULE OF INSTRUCTION

Title - POULTRY PRODUCTION

Code - 01.010106-01

OBJECTIVES to be obtained:

The student will be able to:

1. Investigate the economic importance of the poultry industry and the types of poultry enterprises.
2. Select a breed or strain of poultry for a given type of operation and list six factors involved in making the selection.
3. Plan facilities for a given poultry enterprise.
4. Prepare a list of 25 poultry diseases and demonstrate a working knowledge of ten diseases, listing causal agents, symptoms, post mortem examination results, treatment and prevention.
5. Plan a disease prevention and sanitation program for a given poultry enterprise.
6. Plan a feeding program for a given type of poultry enterprise.
7. Determine and list the marketing outlets for eggs available to him in his local area and select the one most suited to his own needs.
8. Plan a program for marketing birds for a given situation.
9. Develop a program of keeping necessary poultry records.
10. Determine the profitableness of a poultry enterprise through record anlaysis.

Code - 01.010106-01

AGRICULTURAL

Title - POULTRY PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 1. The Poultry Industry Objective 1 Investigate the economic importance of the poultry industry and the types of poultry enterprises.	A. Present economic statistics . New York State . Local county or area . Regional data B. Table eggs C. Hatching eggs and breeder farms D. Hatcheries E. Meat bird production F. Broiler production G. Ducks H. Turkeys I. Pheasants and game birds J. Employment opportunity
	176

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion Use overhead projector. Make overlays to present data from the current "Agricultural Situation and Outlook Handbook," Cornell University for poultry in New York State. B. Field trips to local or regional poultry farms and hatcheries to see conventional and environmental controlled housing. C. Resource person--have outstanding poultryman to talk to students in class or at his place of business on opportunities in the poultry business or tape interview used in class. D. Discussion Opportunities for employment in poultry will be identified.	A. Notes based on discussion of the industry and opportunities B. Identification of job posibilities in the industry. C. Prepare a brief written report analyzing the poultry industry in terms of the economic data.	A. Teachers evaluation of written report on interpretation of poultry data.

Code - 01.010106-01

Title - POULTRY PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 2. Selecting Poultry Breeds and Strains Objective 2 Select a breed or strain of poultry for a given type of operation listing 6 factors involved in making the selection.	A. Table egg production . White leghorns . Rhode Island reds . Hybrids, two, three and four way crosses . Barred rocks . New Hampshires . Sex-linked B. Meat Production . Production crosses . White rocks . Silver crosses C. Factors involved in selection of breed or strain . Livability . Rate of production . Persistency of production . Feed conversion . Body size-salvage value . Egg size, shell texture, color and shape . Interior egg quality . Freedom from broodiness . Rate of maturity . Rate of feathering . Availability of stock nearby. D. Economic outlook to selection Compare table egg production with meat bird production. Discuss: . Housing . Feed efficiency . Nature of enterprises . Equipment . Potential profits

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion using slides and/or photographs or film strip of the various breeds and varieties showing characteristics of the birds. . Show DeKalb film strip on genetic factors and breeding points.	A. Preparation of chart of breed characteristics . Students make a chart showing the outstanding characteristics of the breeds and/or varieties.	A. Oral or written quiz on poultry. Identification and use using slides or photos.
B. Discussion and supervised study using trade literature, texts and bulletins. Students develop a list of factors to consider in selecting a breed or strain for both table egg and meat production.	B. Development of list of factors necessary to use in selection of strain or breed.	B. Instructor's evaluation of a report dealing with the selection of birds.
C. Discussion on possible sources of birds using trade literature-advertisements.	C. Students evaluate random sample flock tests and official egg laying contests reports and record of performance reports using magazines.	C. Oral or written quiz on factors for selection and explanation of importance.
D. Supervised study. Interpret data regarding feed conversion, egg production, livability, body size, salvage value, egg size and color shell texture and shape, freedom from broodiness, rate of feathering and maturity.	D. Evaluate literature and reports for high production and conformation trait associated with meat production.	
E. Lecture and discussion of enterprise choice to selection in terms of possible returns.	E. Determine profitableness of the egg production vs meat production for the local area.	
	F. Preparation of a report on selecting enterprise to follow and strain of birds to raise reflecting the enterprise situation.	

Code - 01.010106-01

Title - POULTRY PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Housing Facilities Objective 3 Plan facilities for a given poultry enterprise.	Determining housing requirement A. Enterprise . Broiler-roaster production . Laying flock-floor . Laying flock-cages B. Structures . Broiler colony house . Multiple unit . Multiple story . site selection and location . type of construction . width-length-ceiling height . insulation-walls-ceilings-vapor barrier . ventilation-controlled environment . heating-wiring-plumbing . utility room . construction materials . floors-doors . emergency electrical service . water supply . manure and litter disposal C. Equipment . Nutritional . brooders . feeders-grain handling . waterers . roots (if used) . Layer . nesting equipment (if used) . egg gathering equipment . egg room equipment . cages-type-capacity-system . broiler-roaster handling equipment . loading dock . cleaning equipment . manure handling equipment . disposal of dead birds . sanitation equipment

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion and supervised study using bulletin literature covering the requirements of each of the three enterprise systems.	A. Students procure from suppliers, building materials and plans. Hardware companies and local lumberyards are good sources for literature and samples of materials.	A. Oral or written test
B. Guest speakers to the class as a panel of a representative of equipment supplier, extension specialist, egg producer, meat producer and a contractor to speak on their experiences and suggestions and recommendations for structures and equipment.	B. Have students determine approximate costs for items of equipment and cost of construction of buildings and develop plan for poultry housing.	B. Teacher evaluation of plan for poultry housing to meet requirements for a given type of situation.
C. Use of taped interviews together with slides taken at the operations.	C. Preparation of floor plans.	
D. Field trip to several producers to observe their physical set up and discuss with the operator the system, operation, desirable features and features to be changed.	D. Model construction.	
E. Films and discussion. Available through equipment companies.		
F. Use floor plans for discussion purposes. Both those available from Cornell and Hoards Dairyman and commercial firms.		

OBJECTIVES BY UNIT	CONTENT
Unit 4 . Sanitation and health program. Objective 4 Prepare a list of 25 poultry diseases and demonstrate a working knowledge of 10 diseases and conditions listing causal agents, symptoms, P.M.E. treatment and prevention.	Basic materials to be included A. Vocabulary of terms associated with disease and health B. Study of anatomy of the various species C. Post mortem of birds D. Diseases of Poultry . Non Nutritional Diseases to Include .blue comb .bronchitis c r d. .bumblefoot .epidemic tremor .lewkosis .new castle .fowl pox .pullorium . Nutritional Diseases-deficiency .Mineral dificiency .calcium .iron .phosphorus .iodine .sodium-potassium .zinc .magnesium .Vitamin . A . K . B complex . C . E . cannibalism . cage fatigue . fatty liver syndrome . aplastic anemia . Internal Parasite . coccidiosis . worms . External Parasites . lice . mites . Other ailments or health problems
Objective 5 Plan a disease prevention and sanitation program for a poultry enterprise.	A. Prevention of diseases . Sanitation-disinfecting-fumigation . Vaccination program for specific disease . Antibiotic administration . Disposal of dead birds . Manure & litter disposal

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Prepare a list of health items-page 150, Poultry Science, for students to copy and understand through supervised study.	A. Preparation of word identifications.	A. Oral or written test. List 20 diseases of poultry.
B. Use of Nasco overlay-overhead projections-Ditto sheets for labeling by students.	B. Labeling of proposed sheets.	B. Written test. List causes, symptoms and controls for one disease in each of the following categories: . Non-nutritional . Nutritional . Internal parasites . External parasites
C. Disection demonstration of birds.	C. Student assistance in making the*P.M.E. or if enough birds available organize teams for the P.M.E.	C. Teacher evaluation of post mortem examination.
D. Demonstrate the proper technique for making a chicken post mortem.	D. Debeaking. Physical examination of birds for parasites.	
E. Supervised study--Film strip "How to do a Poultry Autopsy" VEP Beacon Profitable Poultry Mgt.	E. Preparation of work sheets on individual diseases.	
F. Demonstration of debeaking and have student participation.		
G. Supervised study and individual instruction in preparation of work sheets for diseases as outlined in the objective.		
H. Field trip to State diagnostic lab closest to school to discuss with veterinarian the more common diseases.		
I. Field trip to local poultry situation to discuss disease problems with operator.		
J. Guest speaker(or tape)of local veterinarian on disease control and prevention.	*P.M.E.=Post Mortem Examination	
K. Color slides of various diseases as to symptoms and P.M.E.		
A. Field trip to local poultry situation to discuss sanitation measures. Examination of equipment.	A. Note information from trips	A. Prepare a written plan to instructor's satisfaction.
B. Discussion with veterinarian of disease prevention program.	B. Operation of sanitation equipment.	
C. Vaccination demonstration and student participation.	C. Preparation of written plan. Participation in operating equipment, mixing spray materials, debeaking, etc.	
D. Independent study and assistance to prepare a written plan for poultry sanitation and disease control.		

Code - 01.010106-01

Title - POULTRY PRODUCTION

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 5. Feeding Programs Objective 6 Plan a feeding program for a given type of poultry enterprise	A. Check starters .High energy feeds .Mash,crumbles,pellets .Medications B. Growing feeds .All mash grower .Grower with hand grains .Controlled feeding system .High energy feeds C. Laying rations Complete feeds .conventional .high energy .laying mash and hard grains .Mash,crumbles,pellets D. Protein,mineral and vitamin requirements E. Purchased feeds .Types .Special feeds F. Home mixed feeds .Premixes,concentrates .Hard grains

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Display the various ingredients that are used to formulate feeds. Supervised study for identification. B. Show students samples of poultry feeds. C. Collect the tags from the poultry feeds available. Have students check the fiber, fat, and protein on the tags. D. Field trips. If possible visit a feed manufacturing plant and observe the feed being made. E. Classroom discussion and board work on feed formulation and nutritional requirement. F. Supervised study. Choose the types of feeds that best meet the needs of the various age groups of birds. G. Resource person. Talk with representative of feed company dealing with complete feeding program. H. Supervised practice. Divide class into groups to plan a feeding program for a given situation.	A. Work out lab unit on purchasing commercial feeds vs home mixed feeds using local grains and concentrates. B. Group planning and preparation of the report. C. Study the ingredients listed on the feed tags. D. Select rations that meet the nutritional requirement of the birds. E. Develop economical feeding program. F. Recognize out of condition feeds.	A. Teacher evaluation of prepared planned feeding program for a given type of poultry enterprise. B. Teacher evaluation of determining costs of feeding birds in given situations using local feed prices and ingredient prices.

Code - 01.010106-01

Title - POULTRY PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 6 .Poultry Marketing Objective 7 Determine and list the marketing outlets for eggs available to him in his local area and select the one most suited to his own needs.	A.Producing high quality eggs B.Market service agreements C.Types of markets .Local .Contract agreements .Cooperatives D.Egg marketing problems E.Egg price factors F.Egg grading,packaging and handling G.Maintaining good egg quality
Objective 8 Plan a program for marketing birds for a given situation	A. Situations to consider .Laying flock .Culling birds .Mass disposal .Meat production .Game bird .Broiler-fryer .Roaster .Capon .Market .Seasonal .Holiday situation

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture. Overhead projector - study the parts of the egg and identify the characteristics of grade A eggs. B. Supervised study of U.S. standards for shell eggs (Tubb p 248, Poultry Science) and weight classes for shell eggs. C. Film strip "Grading Eggs for Quality"-VED. Discussion. D. Have an egg dealer speak to the class in school or at his place of business on markets and discuss egg marketing agreements. E. Classroom discussion led by teacher-markets & agreements. F. Demonstrate how to candle and grade eggs. Use Cornell Bull. followed by student practice. G. Field trip to refrigerated egg room and egg grading equipment for both wholesale and retail trade.	A. Practice candling eggs and grading of eggs-packing eggs for both wholesale and retail trade. Weighing eggs. B. Prepare graphs on local conditions for egg marketing. C. Study market service agreements. D. Prepare graphs and charts on egg prices and cycles.	A. Handling techniques for eggs. B. Egg grading by weight and quality as a contrast similar to that used at State Fair. C. Prepare a plan for marketing of shell eggs for a given situation. D. Determine best outlet for shell eggs for a local situation.
A. Lecture and discussion of disposal of birds. B. Visit to poultry operations both egg and meat production situations and discuss with operator the program used to dispose of birds. C. Discuss problem with local processing plant operation as to his operational and tour facilities. D. Discuss with operators marketing agreements for birds. E. Demonstrate culling procedure and estimation of egg production of individual birds. NASCO film strip on culling poultry. F. Supervised practice in cull or keep of birds.	A. Cull or keep practice and egg production estimation. B. Preparation of a written plan of one method for marketing birds. C. Study of market information for supply and demand.	A. Teacher evaluation of ability to determine egg production for cull or keep. Select a market for disposal of birds as a written plan. B. Teacher's evaluation of this written plan B.

Code - 01.010106-01

AGRICULTURAL

Title - POULTRY PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 7 .Management of a Poultry Enterprise Objective 9 Develop a program of keeping necessary poultry records	A. Those needed B. Useful form C. Permanent and temporary .Inventory .Cash account .Production records .Mortality and health .Feed intake
Objective 10 Ability to determine the profitableness of a poultry enterprise through record analysis	A. Summary of data from records "Chicken Arithmetic" B. Farm Business chart for poultry C. Comparison by enterprises .Cost per pullet .Cost to produce a dozen eggs .Feed costs .Labor and machinery costs .Chicken arithmetic

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion of the various types of records needed and the kinds of recordkeeping books available for the operation and flock(s). B. Supervised study. Students examination of various records available from poultry magazines and feed companies.	A. Examination of poultry records kept by various poultry operators. B. Develop a set of poultry records for a given situation.	A. Teacher evaluation of the records.
A. Lecture and discussion using data from a poultry producer.Show the source of data pulled together for analysis. B. Supervised study-Farm Management Handbook. Determine cost factors and mechanics of calculations. C. Supervised study. Problem sheets for practice. D. Supervised study. Preparation of farm business charts.	A. Preparation of Farm Business charts. B. Study farm business analysis information,county records from extension keeping clubs and evaluate a poultry operation. C. Prepare a farm business problem similar to that of those used at Cornell Farm and Home Week in the early 1960's of a poultry problem together with several alternatives for students to make best plan.	A. Oral or written test. . Chicken arithmetic . Farm Business chart . Analysis of poultry business B. Teacher evaluation of farm business problem solution.

MODULE OF INSTRUCTION

Title - POULTRY PRODUCTION Code - 01.010106-01

RESOURCE MATERIALS

Books;

Poultry Science - M.E.Ensminger-Interstate Publisher-Danville-Ill.
Veterinary Guide For Farmers-G.W.Stamm-Hawthorn Publisher-N.Y.N.Y.
Feeds & Feeding-F.B.Morrison-Morrison Publishing Co.-Ithaca-N.Y.
Disease and Parasites of Poultry-Edgar Hugh Barger & Leslie Elsworth Card-Lea & Febiger-Philadelphia
Poultry Husbandry-Morley A. Gull-McGraw Hill-New York
Profitable Poultry Management-Staff-Deacon Milling Company

Bulletins:

Cornell Extension Bulletins -	#E1140	Ventilation for Poultry Houses
	#E1145	Emergency Warning System for Poultry Houses
	# S82	Egg Processing Plants for Farms
	#E1195	Economics Poultry Manual Disposal
	#E1062	Raising Replacement Pullets in New York
	#E 887	Culling for Egg Production

Periodicals:

Poultry Tribune-Watt Publishing Co.-Mt. Morris-Ill.

Audiovisuals:

VEP Slide film Poultry Selection and Judging
Dekalb-Filmstrip Poultry Genetics-Breeds
VEP How to Do a Poultry Autopsy
NASCO Poultry Supplies-egg candlers,egg grader,debeaker,incubators, brooders,lamps,cages,leg bands,poultry knives
Vocational Education Productions-Film strips,
The Poultry Industry,Embryo Development of the Chick,Grading Eggs for Quality,Poultry Autopsy,Poultry Brooding Management,Poultry Selection and Judging

MODULE OF INSTRUCTION

Title - SELECTING AND HANDLING DOGS AND CATS Code -01.0101010701-01

DESCRIPTION:

In this module students will learn the breeding standards, purpose and conformation knowledge to choose quality animals. The student will know the basic standards of each group and breed of domestic dogs and cats. With this knowledge, the proper combination of animals may be chosen for breeding.

The methods of properly restraining dogs and cats of all sizes and temperament, by hand and with restraining devices will be practiced. The advantages and disadvantages of medication for restraint will be observed. Methods of capturing loose animals quickly and safely will also be an important consideration.

The student will develop confidence, patience and firmness in handling all animals and be able to remove and return them to their cages.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Breed standard of cats and dogs	6	6
2. Safety and proper handling of cats and dogs	2	16
	8	22

Revised June, 1974

MODULE OF INSTRUCTION

Title - SELECTING AND HANDLING DOGS AND CATS

Code - 01.0101010701-01

OBJECTIVES to be obtained:

The student will be able to:

1. Using the published breed standards, consistently select the top animal from a group of three dogs or cats, using the published breed standards.
2. Identify 15 breeds of cats by length and color of hair and eye color.
3. List 6 major categories of dogs and give the major purpose of each.
4. List 3 breeds of dogs in each major category and state 5 outstanding features of each.
5. Properly restrain cats and dogs of all sizes and temperaments by head and restraining devices.
6. Explain the proper use of medicinal restraints and reactions to medication used for restraining dogs and cats.
7. Develop confidence, patience and firmness in capturing loose animals and in removing and returning animals to cages safely.

Code - 01.0101010701-01

Title - SELECTING AND HANDLING DOGS AND CATS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Breed standard of cats and dogs Objective #1 Consistently select the top animal from a group of 3 dogs or cats, using the published breed standards.	A. Type B. Conformation
Objective #2 Identify 15 breeds of cats by length and color of hair and eye color.	A. Various breeds of domestic cats . Long-haired breeds . Short-haired breeds . Approved eye colors
Objective #3 List 6 major groups of dogs and give the major purpose of each.	A. Various breeds of dogs . Sporting breeds . Working breeds . herding . guard dogs . sled dogs . Terrier breeds . Hound breeds . Toy breeds . Nonsporting breeds
Objective #4 List 3 breeds of dogs in each major category of dogs and cats and state the 5 outstanding features of each.	A. Categories outlined same as above

EDUCATION 01.0101010701-01 - Code

SELECTING AND HANDLING DOGS AND CATS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Text - AKC - Complete Book of Dogs A. Lecture - discussion B. Supervised study C. Text	A. Students will do supervised study on breeds of dogs and cats of their interest. B. Note taking	A. Lab - oral testing Use judging score cards and give reasons for animal placement.
A. Demonstration and discussion of cat and dog breed standards and purpose. (Using live samples). B. Class discussion C. Supervised practice	A. Judge animals of the same breed as to the breed standards.	A. Oral or written identification of 15 breeds of cats by length and color of hair and eye color.
A. Lecture B. Breeding and selling of pure bred animals. C. Class discussion D. Field trip to breeding kennel. E. Speaker	A. Care for and breed pure bred animals.	A. written or oral test relating each major group of dogs to a purpose.
A. Supervised study B. Field trip to breeders, and dog and cat shows.	A. Compile notes B. Prepare questions for field trip.	A. Teacher evaluation of student's list

Code - 01.0101010701-01

Title - SELECTING AND HANDLING DOGS AND CATS

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Safety and proper handling of cats and dogs Objective #5 Properly restrain cats and dogs of all sizes and temperament by hand and restraining devices.	A. Cats . Hand restraining . Restraining devices . Discussion of medication for restraining B. Dogs . Hand restraining . Restraining devices
Objective #6 Explain the proper use and reaction to medications used for restraining dogs and cats.	A. Use of medication for restraining . Approach . Injectiion . Time
Objective #7 Develop confidence, patience and firmness in . Capturing loose dogs and cats . Removing and returning dogs and cats to cages	A. Removal and returning of dogs and cats to cages . Methods . Safety

EDUCATION 01.0101010701-01 - Code

SELECTING AND HANDLING DOGS AND CATS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Text: I.A.T. Manual U.F.A.W. Handbook Film A. A. Demonstration of the restraint of dogs and cats by . Hand . Restraining devices	A. Students will practice items demonstrated by instructor. B. Judge each other on their restraining techniques.	A. Teacher's evaluation of student restraining a small dog, medium dog, and cat by: . Hand . Two different restraining devices
A. Class discussion B. Demonstration by veterinarian of the use of medications for restraint of dogs and cats.	A. Observe a veterinarian as he properly uses several forms of medication for restraining. B. Record the reactions noticed in the animal.	A. Oral or written test: . List the symptoms to be expected in medicating cats and dogs in restraining with 75% accuracy.
A. Class discussion B. Teacher demonstration in the proper methods of: . Capturing loose dogs and cats . Removing and returning dogs and cats to cages.	A. The student will daily: . Properly remove and return all animals as caging is cleaned. . Properly capture loose dogs and cats.	A. Teacher's evaluation of student's ability to: . Capture 2 loose cats and 2 dogs . Remove and return 3 dogs and 3 cats to their cages.

MODULE OF INSTRUCTION

Title - SELECTING AND HANDLING DOGS AND CATS Code -01.0101010701-01

RESOURCE MATERIALS

Books - A. The UFAW Handbook

Care and Mangement of Laboratory Animals
Edited by staff of UFAW, 3d edition — E. & S. Livingstone LTD, England $22.00

B. The I.A.T. Manual of Laboratory Animal Practice and Techniques

D. J. Short & D. P. Woodnott, 2d edition, Charles C. Thomas, Springfield, Ill, $14.00

C. The Complete Book of Dog Care

Leon F. Whitney, Doubleday & Company, Garden City, New York

D. Manual for Laboratory Animal Technicians

Publication 67-3, American Association for Animal Science, Joliet, Ill. $3.00

E. The A.K.C. Complete Book of Dogs

American Kennel Club, 50 Madison Avenue, New York, N. Y. $6.00

Periodicals -

A. Laboratory Animal Digest, Ralston Purina Co., St. Louis, Missouri

B. Dog Research, Gaines Dog Research Center, 250 Park Avenue, New York, New York

C. Laboratory Animal Care, American Association of Laboratory Animal Science, Box 10, Joliet, Ill.

Audiovisuals -

Films

A. Handling Laboratory Animals, American Association for Laboratory Animal Science, Joliet, Ill.

B. Safe Handling of Laboratory Animals, National Medical Audiovisual Center, Chamblee, Georgia

C. Laboratory Dogs, National Medical Audiovisual Center, Chamblee, Georgia

MODULE OF INSTRUCTION

Title - Basic Dog Grooming

Code - 01.0101010701-02

DESCRIPTION:

The student will be involved in orientation to dog grooming activities. This will include practicing grooming styles, and cleaning and maintaining the grooming shop. Knowledge and use of grooming tools will be stressed. Students will develop basic skills in use, maintenance and function of this equipment. Time will also be devoted to ordering proper equipment.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Orientation to basic dog grooming	1	9
2. Equipment needed for dog grooming	1	4
3. Function and proper use of equipment	1	6
4. Care and maintenance of equipment	1	4
5. Purchasing of equipment	1	2
	5	25

Revised June 1975

MODULE OF INSTRUCTION

Title - BASIC DOG GROOMING Code - 01.0101010701.02

OBJECTIVES to be obtained:

The student will be able to:

1. List major responsibilities of a dog groomer.
2. Identify and list grooming tools as listed by the instructor.
3. Demonstrate the function and the proper use of all equipment needed in dog grooming.
4. Demonstrate care and maintenance of dog grooming equipment.
5. List and order equipment identified for quality and usability for grooming.

Code - 01.0101010701-02

Title - BASIC DOG GROOMING

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Orientation to basic dog grooming Objective #1 Students will be able to list major responsibilities of a dog groomer (as stated by the instructor).	A. List responsibilities of groomers B. Types of working conditions in shops C. Procedures in animal handling and care while in for grooming D. Cleaning and care of grooming shop E. Students will handle various dogs F. Identify all various hair cutting styles on different breeds Poodles . Sporting . Royal dutch . Puppy cut . High shoulders . Four pom poms . Barrel cut . Kennel cut . Terrier cuts . Spaniels
Unit 2 - Equipment needed for dog grooming Objective #2 Students will be able to identify and list grooming tools as listed by instructor.	A. List of equipment for dog grooming: . Clippers (Oster A5 and A2) . Blades (all types) . Scissors (all types) . Thinning shears (single edge - double edge) . Brushes (slicker wire brush, pin, and bristle) . Combs (coarse, medium, fine) . Rakes, mat splitters(oliver mat & tangle splitte . Nail tools (scissor type, guillotine type) . Nail file . Grooming table (restraining equipment) . Dryers (cage, floor, hand types) . Ear cleaning tools (needle holder, forceps) . Stripping comb B. Special Safety Equipment: .Lube spray (Oster) . Silver nitrate sticks (nail bleeding) . Styptic powder & stick (cuts, minor) . Medicated powder . Ointment (Desitin oint.) . Optical ointment . Ear oil, powder

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher demonstration using live animals and grooming charts (clipping styles all breeds) B. Field trip to grooming shops (local) D. Field trip (local) dog shows (when available) Texts "Grooming" "Clipping Poodle" (by Shirlee A. Kalstone) "Clipping & Grooming Your Poodle" (by Pearl Stone) Guest speakers - shop owners, managers, handlers Past experience Proper use of cleaning equipment (demonstration) (disinfectants)	A. Work in lab with various dogs. B. Use of disinfectants and cleaners in shop areas. C. Set up a shop and arrange - professionally.	A. Oral or written test on grooming styles and shop responsibilities.
A. Discuss display equipment B. Dittos with list of equipment C. Texts (Shirlee Kalstone) & Pubs. (Pets/Supplies/Marketing) D. Past experience E. Catalogs	A. Set up individual work areas, with proper equipment at each area (as stated by instructor). B. Examine and handle all equipment	A. Oral or written test identifying tools needed for dog grooming.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Function and proper use of equipment Objective #3 Students will demonstrate the function and use of dog grooming equipment	A. Holding (Oster clipper scissors, comb, brush) B. Use C. Function D. Safety
Unit 4 - Care and maintenance of equipment Objective #4 Demonstrate care and maintenance of dog grooming equipment	A. List of problems which might arise in grooming equipment and how to deal with them. . Care of equipment (preventive maintenance) . How to clean a clipper . How to oil and grease a clipper . How to change brushes . How to change blades . How to sharpen blades and shears . How to solve heat problems with clipper and blades (Oster spray lube)

E D U C A T I O N

01.0101010701-02 - Code

BASIC DOG GROOMING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Instructor will demonstrate to class how each tool is held, used and its function B. Demonstrate under grooming shop conditions. C. Discuss safety and neatness D. Slide presentation from (Lambert Kay) Poodle grooming E. Film	A. Students will use equipment under shop conditions and hold, use, and understand what it will do. B. Comb and brush a dog. C. Attach and remove clipper blades from Oster A2 & A5 machine D. Scissor and use thinning shears on lab dogs. E. Judge how much hair each blade leaves.	A. Teacher evaluation of students ability to groom.
A. Texts B. Supervised study using magazines. C. Publications for maintenance of equipment D. Demonstrate how to change brushes in an Oster A5 or A2 machine. E. Demonstrate symptoms of pulsating and erratic machines and how to correct them. F. Demonstrate how to clean out hair that gets inside the machine and what causes the machine to get hot.	A. Clean and maintain equipment B. Change brushes in A5 and A2 Oster machine - oil, grease C. Spray lube blades to (cool, lube, and clean) prevent failure. D. Students will remove hair from clippers to prevent machine from getting hot.	A. Teacher evaluation of students ability to maintain clippers and shears.

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Purchasing of equipment Objective #5 Students will be able to list and order equipment, (for quality and usability) for grooming.	A. Quality of different types of equipment from: Oster Co. General Co. Lambert Kay B. Catalogs: C. Prices:

EDUCATION

01.0101010701-02 - Code

BASIC DOG GROOMING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrating quality of workmanship in equipment for grooming for durability, strength, ease of operation.	A. Examine and use various pieces of equipment in comparison to quality, strength, and durability.	A. Teacher evaluation of verbal statements on comparisons of different equipment.
B. Class discussion-quantity of equipment groomer should have on hand.	B. Demonstrate ordering and use of catalogs for grooming.	B. Oral or written test on quality comparison in grooming tool.
C. Catalogs and ordering procedures.		
D. Guest speaker from equipment company.		

MODULE OF INSTRUCTION

Title - Basic Dog Grooming Code - 01.0101010701-02

RESOURCE MATERIALS

A. Books - Whitney, L.F. The Complete Book of Dog Care. Doubleday, Garden City, N.Y.

Poodle Grooming
Terrier Grooming
Spaniels Grooming
} by Shirlee Kalstone, 2224 Monongahela Blvd., McKeesport, Penn. 15132

B. Periodicals - Pets/Supplies/Marketing, by Harcourt, Brace, Jovanovich Publications, Corp., 757 Third Ave., New York 10017

- The Professional Groomer, by Shirlee A. Kalstone, 2224 Monongahela Blvd., McKeesport, Penn. 15132

C. Audiovisuals - Poodle Grooming by Shirlee Kalstone, Lambert Kay Corp., Los Angeles, Calif.

MODULE OF INSTRUCTION

Title - EXTERNAL CARE AND PARTS OF THE DOG   Code - 01.0101010701-03

DESCRIPTION:

In this module the student will be involved in identifying the profile of a dog. Work will be done with live animals and in the laboratory setting. Particular attention will be given to special aspects of grooming including the dog's nails and ears. Equipment use and care will be stressed.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Dog profile	1	10
2. Canine ears	1	8
3. Canine nails	2	8
	4	26

Revised June 1974

MODULE OF INSTRUCTION

Title - EXTERNAL CARE AND PARTS OF THE DOG Code - 01.010101010701-03

OBJECTIVES to be obtained:

The student will be able to:

1. List and identify 25 areas which include danger areas on a dog
2. Identify parts of the ear.
3. Clean canine ears, demonstrating skills in safety and without discomfort to the animal.
4. Cut nails to the recommended acceptance of the instructor.
5. File nails

Code - 01.010101010701-03

A G R I C U L T U R A L

Title - EXTERNAL CARE AND PARTS OF THE DOG

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Dog profile Objective #1 List and identify 25 areas, including danger areas on the dog	A. Transparencies of profile of a dog B. Parts listed
Unit 2 - Canine ears Identify the parts of a canine ear.	A. Ear parts B. More sensitive areas
Objective #3 Students will clean canine ears	A. Cleaning materials: . Cotton (balls, swabs) . Mineral oil (room temperature) . Powder (medicated or plain) . Paper towels . Alcohol B. Tools: . Tweezers (blunt) . Forceps (needle or Kelly type) . Tray with alcohol C. Process: . Place animal on table . Fold ear over side of head . Use of forceps to remove hair . Use of swabs . Clean with oil

01.010101010701-03 - Code

EXTERNAL CARE AND PARTS OF THE DOG - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Transparency of dog B. Ditto of external dog parts C. Class discussion: . The 25 points of the dogs and the danger areas, in grooming.	A. Mark up ditto and take notes so that the various parts of a dog can be remembered.	A. Oral or written objective test of the 25 parts of the dog's profile.
A. Class discussion B. Supervised study C. Ditto - Diagram of canine ear	A. Observe teacher demonstrations. B. Record notes on important earparts.	A. Oral or written test to identify the parts of the canine ear.
A. Discussion of cleaning materials and tools. B. Instructor will demonstrate cleaning ears	A. Practice cleaning ear of a dog, pulling hair out and swabbing with oil.	A. Practical test B. Remove all hair and dirt to standards of instruction.

Code - 01.010101010701-03

Title - EXTERNAL CARE AND PARTS OF THE DOG

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Canine nails Objective #4 Cut nails to the recommended acceptance of the instructor	A. Equipment for cutting nails . Scissor type nail cutters . Guillotine type B. Safety . Animal's black nails and white nails . Technicians C. Procedure D. Use of coagulants for bleeding from overcutting . Silver nitrate
Objective #5 File nails	A. Types of files B. Safety . Animals . white and black nails . technicians C. Procedure . Holding of paw . Use of both hands . File in upward motions D. Use of coagulants for bleeding from over cutting . Silver nitrate *Note - if nail does not need to be cut, file only

01.010101010701-03 - Code

EXTERNAL CARE AND PARTS OF THE DOG - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Demonstration: Diagram on chalkboard of nail show how much of nail to cut so as not to sever quick. C. Demonstration: Live dog Hold nail clippers in hand, with the hand grasping foot and proceed to cut nail being careful not to cut quick.	A. Students will use live dogs to do what instructor has demonstrated. B. Cut nails	A. Instructor's evaluation of student's ability to cut nails on a dog
A. Review above demonstration from a diagram of nail B. Demonstration: After nail has been cut, hold paw in one hand and file in other. File in an upward motion until rounded. C. The procedure is followed on each nail	A. Observe demonstration B. Practice what has been observed and file nails on a live dog.	A. Instructor's evaluation of students ability to file dogs nails.

MODULE OF INSTRUCTION

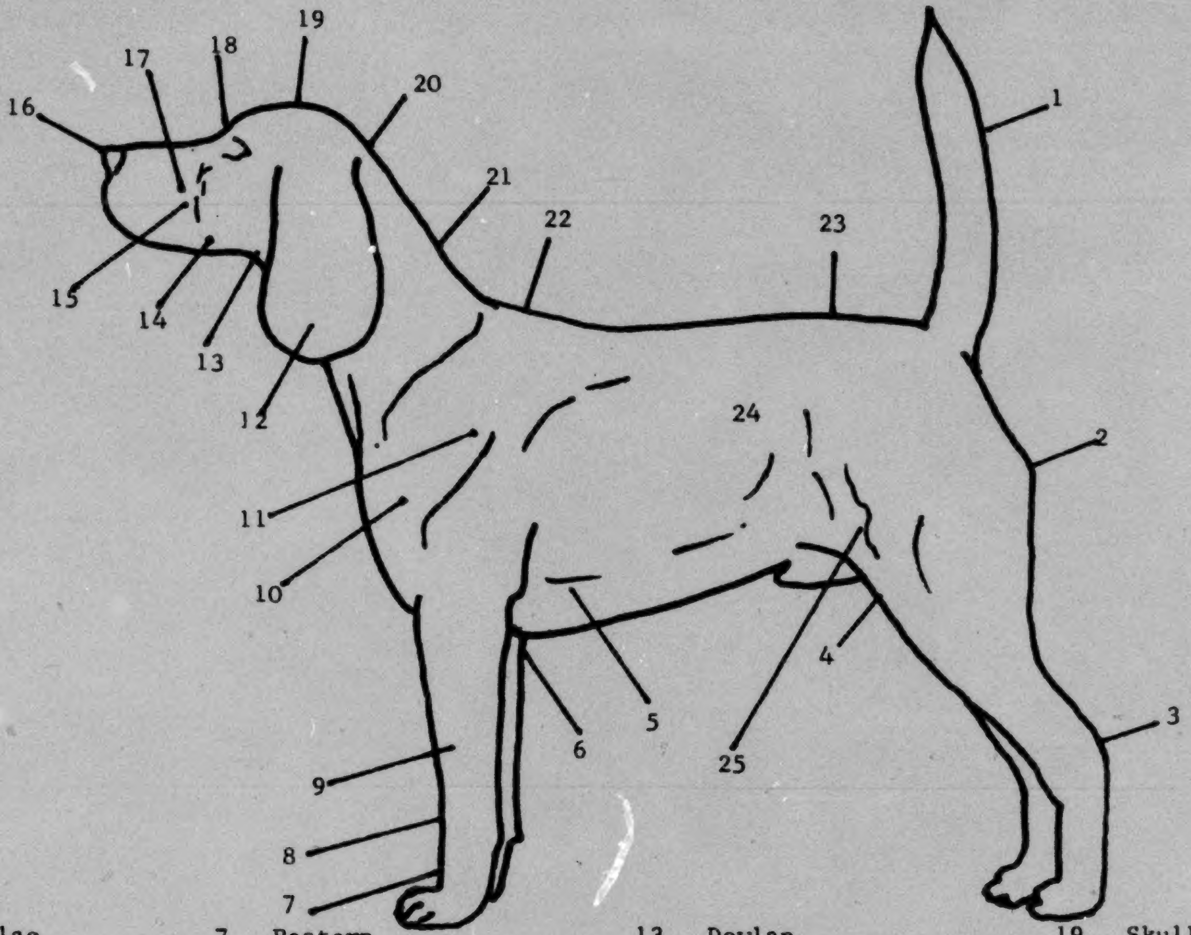
Title - EXTERNAL CARE AND PARTS OF THE DOG   Code - 01.0101010701-03

RESOURCE MATERIALS

Overhead slides, teacher made.

Teacher made ditto.

PROFILE OF A DOG



1. Brush or flag
2. Point of rump
3. Hock
4. Stifle
5. Chest
6. Elbow
7. Pastern
8. Knee
9. Forearm
10. Point of shoulder
11. Shoulder
12. Ear or leather
13. Dewlap
14. Lips or flews
15. Cheek
16. Nose
17. Muzzle
18. Stop
19. Skull
20. Occiput
21. Arch or chest
22. Withers or top of shoulders
23. Hip
24. Loin
25. Tuck

MODULE OF INSTRUCTION

Title - TRAINING DOGS

Code - 01.0101010701-04

DESCRIPTION:

The student will learn to train a dog by first learning how dogs react to different types of rewards and punishments. The student will then learn to train a puppy or dog in simple things such as house breaking, controlling barking and curbing. The student will then learn to train dogs to heel and respond to commands such as sit, stand, and stay. The student will be able to apply this knowledge in training dogs to do tricks such as rolling over and playing dead.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. How Dogs Learn	1	3
2. Simple Training	0	6
3. Novice Obedience Training	0	8
4. Advanced Obedience Training	0	8
5. Teaching Tricks	0	4
	1	29

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Revised April '75

MODULE OF INSTRUCTION

Title - Training Dogs

Code - 01.0101010701-04

OBJECTIVES to be obtained:

The student will be able to:

1. List 5 possible reactions of a dog to specific forms of training and relate dogs reactions to these various methods.

2. Demonstrate skills in making use of the dogs reactions in training them.

3. House break and curb a dog.

4. Demonstrate the methods used to control a dogs barking and jumping on people.

5. Begin training a dog to heel, sit, and stand, or stay on command.

6. Begin training a dog to come when called, lie down, carry and retrieve items.

7. Demonstrate skills necessary to train dogs tricks such as playing dead or rolling over.

Code - 01.0101010701-04

Title - Training Dogs

OBJECTIVES BY UNIT	CONTENT
Unit 1 - How Dogs Learn Objective 1 List 5 possible reactions of a dog to specific methods of training, and relate dogs reactions to these various methods.	A. Reward versus punishment . Voice commands affect on dogs . How hand and body movements affect dogs . Contact (physical) . hitting . rewarding B. The trainers effectiveness based on his control C. Training periods; length and frequency
Objective 2 Demonstrate skills in making use of the dogs reactions in training them.	A. Reward - punishment . Food . Leash control B. Trainer control C. Time periods and frequency

01.0101010701-04 - Code

Training Dogs - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - Dog obedience B. Class discussion C. Teacher Demonstrations on dogs behavior to rewards and punishments. D. Field trip to kennels and shows where dogs are trained and being trained.	A. Note taking B. Participate in class discussion C. Practice methods of relating to dogs as demonstrated D. Participate in field trip activities E. Observe animals behavior to reward and punishment	A. Oral or written test on possible reactions of a dog to specific examples of training techniques.
A. Review of demonstration rewards and punishment B. Supervised practice	A. Observe demonstration B. Discussion of demonstration C. Practice skills	A. Teacher evaluation of students ability to control dog, using the dogs reactions.

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Simple Training Objective 3 House break and curb a dog	A. House breaking a dog B. Curb training a dog C. Controlling dogs barking D. Teething of dogs; problems and control
Objective 4 Demonstrate the methods used to control a dogs barking and jumping on people.	A. Rewards - punishment . Food . Leash control B. Barking C. Jumping
Unit 3 - Novice Obedience Training Objective 5 Begin training a dog to heel, sit and stand or stay on command.	A. Training a dog to heel . Heeling on leash . Free heeling B. Training a dog to sit and stand on command C. Training a dog to stay D. Training a dog to come when called (recall) E. Training a dog to lie down

01.0101010701-04 - Code

Training Dogs - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher demonstration B. Speaker or field trip C. Supervised study	A. Observe demonstration B. Question speaker C. Practice procedure demonstrated	A. Teacher evaluation of student ability to progress toward house breaking and curbing a dog.
A. Class lecture and discussion B. Teacher demonstration C. Guest speaker D. Supervised study	A. Compile notes B. Observe demonstration C. Practice demonstrated techniques	A. Teacher evaluation of student ability to house break and curb a dog.
A. Class discussion - reward and punishment relating to obedience B. Guest speaker - dog trainer C. Demonstrations and laboratory exercises on training dogs. D. Supervised study	A. Participate in discussion B. Observe demonstration C. Practice demonstrated techniques D. Begin training one's own dog if applicable	A. Teacher evaluation of student progress in teaching a dog to heel, sit, and stand or stay on command.

Code - - 01.0101010701-04

Title - Training Dogs

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Advanced Obedience Training Objective 6 Begin training a dog to come when called, lie down, carry and retrieve items.	A. Carrying items B. Retrieving C. Jumping objects
Unit 5 - Teaching Tricks Objective 7 Demonstrate skills necessary to train dogs tricks, such as playing dead or rolling over.	A. Intelligence and ability of the animal . The ability range of dogs . The ability of the particular dog B. Age of animal to be trained C. Methods of approach D. Persistance, practice and review

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion - review of principles previously learned. B. Guest speaker - dog trainer C. Teacher demonstration D. Supervised study	A. Participate in discussion B. Observe demonstration C. Practice demonstrated techniques D. Continue training one's own dog	A. Teacher evaluation of student methods of training.
A. Class discussion B. Teacher demonstration C. Field trip to trainer, practicing D. Supervised study E. Public demonstration by the class	A. Participate in class discussion B. Observe demonstration C. Practice skills demonstrated D. Continue practice with one's own dog E. Prepare a group demonstration of the skills learned for a public gathering.	A. Teacher evaluation of student ability to demonstrate skills needed to train a dog.

MODULE OF INSTRUCTION

Title - Training Dogs Code - 01.0101010701-04

RESOURCE MATERIALS

Books - USAF Sentry Dog Program
AF Manual 125-5
U. S. Government Printing Office
Washington, D. C.

Training You To Train Your Dog
Blanche Saunders
Doubleday & Company, Inc.
Garden City, New York

MODULE OF INSTRUCTION

Title - CARE OF BIRDS

Code - 01.0101010702-01

DESCRIPTION:

The instruction will include identification, care for and handling of the common species of pet and laboratory bird. Students will be instructed in recognizing the species of birds and the methods of ringing or banding the legs of individual birds. The student will study environmental requirements such as temperature, humidity and special recommendations for each species. Feed requirements and various methods of restraining or handling birds will be included as part of the instruction. The student will be made aware of the common diseases and problems of birds. Nail clipping and simple first aid procedures are covered in this module.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Types of Birds	2	4
2. Environment and Handling	1	9
3. Health and First Aid	2	7
4. Breeding	1	4
	6	24

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MODULE OF INSTRUCTION

Title - CARE OF BIRDS

Code - 01.0101010702-01

OBJECTIVES to be obtained:

The student will be able to;

1. Identify by sight 30 common pet store and laboratory species of birds.
2. Comfortably handle common pet store and lab species of birds.
3. Ring or band the legs of birds without causing injury to the bird.
4. Prepare a list of requirements of 50 birds including temperature and special requirements in captivity.
5. Handle birds and clip feathers, nails and beaks without injury.
6. Clean bird cages and other equipment to satisfy employer needs.
7. List causes, symptoms and controls of 35 diseases of birds and recognize the live symptoms of 10 of these.
8. List various procedures for breeding birds in captivity and hatching their eggs.

Code - 01.0101010702-01

Title - CARE OF BIRDS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Types of Birds Objective 1 Identify by sight 30 common pet store and lab species of birds	A. Fowl and quail B. Pigeons and doves C. Sparrows and starlings D. Canaries and finches E. Parrakeets and parrots F. Other birds as pets
Unit 2 - Environment and Handling Objective 2 Comfortably handle common pet store and lab species of birds	A. Fear - handlers, birds B. Relaxation C. Approach D. Safety of bird E. Safety of handler . Injury . Disease contamination
Objective 3 Ring and band the legs of birds without causing injury to the birds	A. Approach B. Handling C. Installing the ring

EDUCATION

01.0101010702-01 - Code

CARE OF BIRDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Identification slides of birds B. Class Discussion C. Supervised study D. Give animal identification E. Field trip	A. Compile notes . List of birds . Pictures of birds listed . Particular means of identification	A. Teacher evaluation of student lists and notebooks B. Oral or written test . Identify 30 different common pet store and laboratory species of birds
A. Discussion B. Supervised study C. Demonstration D. Field trip E. Supervised practice	A. Participate in discussion B. Observe demonstration C. Practice handling birds	A. Teacher evaluation of students methods and ease of handling birds

OBJECTIVES BY UNIT	CONTENT
Objective 4 Prepare a list of environmental requirements of 50 birds, including temperature, and special requirements in captivity	A. Housing . Types of cages . holding or stock . breeding . pens or aviaries . show . Temperature, humidity and light requirements . Floor covering (cage) B. Feeding and watering
Objective 5 Handle birds and clip feathers, nails and beaks without injuring them.	A. Handling and controlling birds when clipping . Safety B. Clipping . Feathers . Beaks . Toes
Unit 3 - Health and First Aid Objective 6 Clean bird cages and other equipment to satisfy employer needs	A. Sanitation . Prevention of disease . Odors B. Methods of sterilization . Heat . Chemical

EDUCATION

01.0101010702-01 - Code

CARE OF BIRDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Supervised study . Handbook on cage birds . Lab animal care	A. Participate in class discussion B. Prepare notes of requirements on at least 50 species of birds and record in a notebook	A. Oral or written test . Types of cages . Atmospheric requirements of 10 birds . Feeding requirements B. Teacher evaluation of students list in notebook
A. Teacher demonstration B. Supervised practice	A. Observation of teacher demonstration B. Practice of skills demonstrated	A. Teacher evaluation of students ability to handle and clip birds.
A. Lecture-discussion B. Demonstration of techniques of sterilization . Film, *Surgery of Subcutaneous Tremors in Parrakeets* . *Stroud's Digest on Diseases of Birds* . Supervised study . Supervised practice	A. Take notes B. Participate in discussion C. Practice techniques of sterilization demonstrated	A. Oral or written test .Methods of sterilization .List the sterilants available and relate each to its purpose B. Teacher evaluation of students techniques of sanitation

Code - 01.0101010702-01

Title - CARE OF BIRDS

OBJECTIVES BY UNIT	CONTENT
Objective 7 List causes, symptoms and controls of 35 diseases or ailments of birds and recognize the live symptoms of 10 of these.	A. Precautionary care for new animals B. Disease . Definition . Relationship to stress C. Ailments . Puffing . Loss of feathers . Broken wings or legs . Asthma, colds and fits . Diarrhea and enteritis . Egg binding . Wounds . Other health problems
Unit 4 - Breeding Objective 8 List various procedures for breeding birds in captivity and hatching their eggs.	A. Signs of breeding periods . Seasons . Species involved . Male-female relationship B. Process of mating C. Nesting . Boxes or sites . Nesting materials D. Egg laying . Feeding young . Weaning E. Identification of stock . Banding or ringing legs . Stock records

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Supervised study . Stroud's Digest on Diseases of Birds C. Guest speaker--veterinarian D. Group technique of researching cause, symptoms and control of diseases . Let groups of students prepare portions of the research and report to the rest of the class	A. Participate in discussions B. Prepare questions for speaker C. Compile list of diseases for the notebook	A. Teacher's evaluation of students list of diseases B. Oral or written test . List causes, symptoms and controls of 15 diseases in birds and relate each with the bird it affects. . Demonstrate ability to recognize 10 of these diseases
A. Lecture-discussion B. Supervised study . Film - Chick Embryo . Film - How do Animals Care for their Young C. Observation of birds	A. Participate in class discussion . Vote-taking B. Observe birds in action C. Record dates of copulation	A. Oral or written test . Uro-genital system of male and female . Male-female relationships . Nesting materials . Feeding

RESOURCE MATERIALS

A. Books

Strouds Digest on the Diseases of Birds
Robert Stroud
T.F.H. Publications Inc.
Jersey City, N.J. $9.00

The UFAW Handbook
Care and Management of Laboratory Animals
Edited by Staff of UFAW
3rd Edition
E. & S. Livingstone LTD
England $22.00

Chickens
National Academy of Sciences
Washington D.C.

A Handbook on Cage Birds
Modern Veterinary Practice (Red Book Ed.)
American Veterinary Publications Inc.
Wheaton, Ill.

C. Periodicals

Laboratory Animal Digest
Ralston Purina Co
St. Louis, Missouri

Laboratory Animal Care
American Association for
Laboratory Animal Science
Joliet, Illinois

D. Audiovisuals

Slides 2"by 2" Kodachrome
may be obtained from the Audubon Society
or Biological supply houses such as Wards
or Turtox

Films;

Chick Embryo
McGraw-Hill Book Co
Text-Film Div
New York, New York

How Do Animals Care for Their Young
#A Care of The Young
NBC Animal Series Films
American Library Association

Surgery of Subcutaneous Tumors in Parakeets
American Veterinary Medical Association
Chicago Illinois

MODULE OF INSTRUCTION

Title - **CARE AND MAINTENANCE OF TROPICAL FISH** Code - 01.0101010702-02

DESCRIPTION:

The student will identify the various types of tropical fish. The identification will include the sex of the individual fish. Also select the proper methods of setting up tropical fish tanks (aquariums) for display, breeding, and sales. He will select and breed both the live bearers and egg laying fish. The student will also be able to identify the different types of plants used in aquariums. The care of the fish will include the use of the various types of equipment such as air pumps, filters, breeding equipment and other items used in the aquarium. He also will list the different types of fish diets and the purposes of some of the supplements fed fish. The student will list and identify the different common diseases of tropical fish and plants as well as some of the other problems of fish tank management. The treatment and prevention of the common diseases will also be covered.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Types of tropical fish	1	6
2. Aquatic plants	1	3
3. Aquarium operations	1	9
4. Breeding	1	4
5. Diet and diseases	1	3
	5	25

Revised June 1974

MODULE OF INSTRUCTION

Title - CARE AND MAINTENANCE OF TROPICAL FISH Code - 01.0101010702-02

OBJECTIVES to be obtained:

Student will be able to:

1. Identify 16 anatomical parts of tropical fish
2. Identify 10 types of shoal fish
3. Identify 4 types of surface fish
4. Identify 6 types of bottom fish
5. Sex 1 pair of each group in objectives 1,2,3 and 4
6. Identify and characterize 6 types of egg layers
7. Identify and characterize 6 types of live bearers
8. Identify 12 types of aquarium plants
9. Demonstrate planting and propagation of aquarium plants
10. Demonstrate care and lighting of aquarium plants
11. Identify and use 10 pieces of equipment common to aquariums
12. Set up a balanced aquarium from equipment available in laboratory (wash gravel, check P.H., decorate and calculate amount of fish per tank size)
13. Net and introduce new fish to established aquariums
14. Select and breed 1 pair of live of live bearers and 1 pair of egg layers
15. Demonstrate use of breeding tanks and plant protection for young
16. Demonstrate care of young from young egg and live bearers.
17. Identify and state 8 common diseases and treatment of tropical fish
18. State and identify 5 types of dried and live food used in feeding
19. Demonstrate feeding fish live/dried food and use of automatic feeder
20. Demonstrate methods of raising and storing live food

Code - 01.0101010702-02

AGRICULTURAL

Title - CARE AND MAINTENANCE OF TROPICAL FISH

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Types of tropical fish Objective #1 Identify 16 anatomical parts of tropical fish	A. Anatomy . Dorsal fin . Adipose fin . Caudal fin . Anal fin . Ventral fin . Pectoral fin . Lower jaw or mandible . Upper jaw or maxillary . Opercle or operculum . Caudal peduncle . Base of caudle . Lateral line . Head . Snout . Eye . Nostrils
Objective #2 Identify 10 types of shoal fish	A. Shoal fish . Neons tetras . Tiger barbs . Rosy tetra . Blood fin . Silver tetra . Daino . Cherry barb . Harlequin rasbora . Zebra . Guppy
Objective #3 Identify 4 types of surface fish	A. Surface fish . Hatchet fish . Archer fish . Silver hatchet fish . African butterfly fish
Objective #4 Identify 6 types of bottom fish	A. Bottom fish . Algae eaters . Plecostomus cat . Black spotted cat . Bronze cat . Whip tail loricaria . Leopard cat
Objective #5 Sex 1 pair from each group of objectives 2-4	A. Shoal B. Surface fish C. Bottom fish

EDUCATION

- Code

- Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Chart of anatomical parts B. Live specimens in tanks C. Texts D. Dittos	A. Fill in on dittos 16 parts of fish. B. Identify on live specimens	A. Oral or written test B. State and/or write 16 anatomical parts of fish from memory
A. Live specimens in tanks B. Slides/movies C. Texts D. Field trips -- local pet shops, aquariums	A. Identify 10 shoal fish in tanks B. Live specimens/pictures	A. Oral or written test B. Identify 10 shoal fish from assorted tanks/pictures from memory.
A. Live specimens in tanks (if possible) or pictures B. Field trips-- pet shops, aquariums	A. Identify 4 surface fish in tanks/pet shops, pictures or aquariums	A. Oral or written test B. Identify 4 surface fish from assorted tanks/pictures.
A. Live specimens in tanks (if possible) or pictures B. Field trips -- pet, shops, aquariums	A. Identify 6 botton fish in tanks B. Live specimens/pictures	A. Oral or written test B. Identify 6 bottom fish from assorted tanks/pictures.
A. Live specimens in tanks (if possible) or pictures.	A. Sex all types of shoal, surface and bottom fish by color or anatomical features	A. Oral or written test B. Sex 1 pair from each group from memory (pictures/live specimens)

OBJECTIVES BY UNIT	CONTENT
Objective #6 Identify and characterize 9 types of egg layers/bubble nest builders	A. Egg layers . Jack Dempsey . Oscor (Marble Cichlid) . Pompadour (Discuss) . Angel fish . Jewel fish . Egyptian Mouth-Breeder . Paradise . Betta . Courames
Objective #7 Identify and characterize 6 types of live bearers	A. Live bearers . Guppies . Swordtails . Platys . Mollies . Herterandria . Gambusia

EDUCATION

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CARE AND MAINTENANCE OF TROPICAL FISH - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Live specimens in tanks/ pictures or slides B. Texts C. Field trips --pet shops	A. Identify and memorize 9 species of egg layers in tanks/pictures	A. Oral or written test B. Identify from memory 9 species of egg layers from assorted fish tanks
A. Same as above	A. Identify and memorize 6 species of live bearers in tanks/pictures	A. Oral or written test B. Identify from memory 6 species of live bearers from assorted fish tanks

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Aquatic plants Objective #8 Identify 12 types of aquarium plants.	A. Aquarium Plants . Twisted vallis . Water clover . Bladderwort . Water hyacinth . Water wisteria . Willow moss . Sagittaria natons . Hygrophila polyperma . Amazon . Anacares . Cabomba . Hornwort
Objective #9 Demonstrate planting and propagation of 4 aquarium plants	B. Aquarium media . Gravel - coarse, medium and fine . Water - P. H. . Pots and soil . Paint brush . Scissors
Objective #10 Demonstration of care and lighting of aquarium plants	C. Lighting . Fertilizer . Scissors . Reflectors . Light (incandescent, fluorescent)
Unit 3 - Aquarium operations Objective #11 Identify and use 10 pieces of equipment most common to aquariums	A. Equipment . Aquarium tanks (5½ gal, 10, 15, 20, 30, 35 and 125 gal) . Pumps (piston, vibrator type) . Filters (corner, undergravel, and outside) . Reflectors (lighting - incandescent, fluorescent) . Gravel (coarse, medium, fine) . Heaters . Thermometers (hanging and floating) . Stands for tanks . P.H. kits (Sr. Wardley PH kit) . Nets . Miscellaneous equipment (charcoal, filter fiber, etc.)

E D U C A T I O N

01.0101010702-02 - Code

CARE AND MAINTENANCE OF TROPICAL FISH - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised Study Pictures of aquatic plants Live specimens in fish tanks/plastic Field trips to pet shops/local ponds Texts	A. Identify 12 common aquarium plants Live pictures	A. Students will select and name 12 aquarium plants from memory Oral or written test
B. Pictures of planting procedures Live plants/plastic Demonstrations of planting and propagation	B. Students will demonstrate planting and propagation Live/plastic plants in various tank setups	B. Students will select and plant 4 types of aquarium plants Demonstrate propagation Oral or written test
C. Texts Demonstration of the use of fertilizer Making cuttings Cleaning Use of lighting (amounts each individual plant needs)	C. Students will demonstrate fertilizing, cleaning, and use of lighting for individual tanks	C. Demonstrate setting up lights/use of sunlight for specific types of plants Use of fertilizers, cleaning plants from memory Oral or written test
A. Use of all aquarium equipment Texts Field trips (local pet shops, zoos) Demonstrations	A. Student usage of all equipment needed to set up balanced aquarium	A. Identify and use 10 most commonly used pieces of equipment from memory Oral or written test

Code - 01.0101010702-02

Title - CARE AND MAINTENANCE OF TROPICAL FISH

OBJECTIVES BY UNIT	CONTENT
Objective #12 Set up a balanced aquarium from equipment available in laboratory (wash gravel, check PH, decorate and calculate amount of fish per tank)	A. Procedures . Clean aquarium . Wash gravel . Decorate . Check PH . Cure tank before fish can be introduced . Fish per tank
Objective #13 Net and introduce new fish to established aquariums	A. Nets, plastic bags, plastic containers and established tanks
Unit 4 - Breeding Tropical Fish Objective 14 Select and breed 1 pair each of live bearers and egg layers.	A. Live Bearers . Guppies . Swordtails . Platys . Mollies Egg Layers . Dempsey . Angel . Betta . Gourames
Objective #15 Demonstrate use of breeding tanks and plant protection for young	A. Facilities B. Breeding tanks/cages (plastic or glass) Types of plants that ofer protection (hair grass, floating plants, etc.)
Objective #16 Demonstrate care of young from live bearers and egg layers	A. Special Care B. Young from egg and live bearers, various types C. Feeding and environment D. Tanks and separation

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use of all aquarium equipment Texts Field trips (local pet shops, zoos) Demonstrations	A. Students will wash gravel, clean tanks, decorate, check P.H., cure water, calculate amount of fish per tank size	A. Set up complete balanced aquarium for equipment in laboratory Clean tanks, wash gravel, decorate and calculate amount of fish per tank Teacher evaluation
A. Use of nets, plastic bags and containers and fish tanks	A. Students will net various species of fish that are compatible with each other in community tanks Demonstrate proper equalizing procedures when transferring new fish	A. Demonstrate netting and equalizing of fish for introduction into new tanks Teacher evaluation
A. Texts/pictures Assorted live bearers and egg layers Tanks Demonstrations Live specimens	A. Selection of breed egg layers and live bearers (color, size and condition)	A. Student will breed 1 pair each of egg layers and live bearers Teacher evaluation
A. Demonstrations of equipment Texts/pictures	A. Set up breeding tank and use of equipment and plants	A. Demonstrate setting up breeding tank and plant protection Teacher evaluation
A. Demonstrations Live specimens Texts	A. Care of various live young Feeding and separation	A. Demonstrate care and feeding of young from live bearers and egg layers Teacher evaluation

Code - 01.0101010702-02 AGRICULTURAL

Title - CARE AND MAINTENANCE OF TROPICAL FISH

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Diet and diseases Objective #17 Identify and state 8 common diseases and treatment of tropical fish	A. Disease . Dropsy . Flukes . Itch . Fungus . Shakes and shimme . Wasting . Swim bladder trouble . Wounds B. Chemicals for Treatment . Itch out . Meteline blue . Mercurochrome . Fungicide . Also use of heat
Objective #18 State and identify 5 types of dried and live tropical fish food	A. Live Food . Daphnia . Tubifex worms . Brine shrimp . Infusoria . White worms B. Dried/Freeze Dried . Daphnia . Tubifex worms . Brine shrimp . Supplements/mixes
Objective #19 Demonstrate feeding fish live/dried food and use of autofish feeder	A. Same food as above . Live Food . Dried/Freeze Dried
Objective #20 Demonstrate methods of raising and storage of live food	A. Raising . Daphnia . Brine shrimp . Tubifex worms B. Storage . Sytrafoam tub . Air stones . Plastic tubing . Bowl . Brine, shrimp eggs . Jar

EDUCATION

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CARE AND MAINTENANCE OF TROPICAL FISH - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration of chemical use disease detection Texts/pictures Live specimens	A. Separate sick fish, diagnose and treat with proper chemical/euthanasia	A. Identify and state 8 common diseases and treatment of tropical fish
A. Samples of live and dried foods Pictures/texts Nutritional values--charts	A. Identification of live and dried food Check protein and nutritional values of dried and live food	A. Identify and state 5 types of dried and live tropical fish food
A. Demonstrate feeding procedures and amount Use of automatic feeders	A. Feed live and dried fish food in proper amounts and use of automatic fish feeder	A. Feed fish live and dried foods and use of automatic fish feeder
A. Demonstrate washing tubifex worms Hatching brine shrimp Storage of all Feeding live food Field trips to catch our own live food (ponds)	A. Hatch brine shrimp Raise white worms Store and care of daphnia and tubifex Siphon off dead live food	A. Student will demonstrate proper methods of hatching brine shrimp and care and storage of other live food

MODULE OF INSTRUCTION

Title - CARE AND MAINTENANCE OF TROPICAL FISH Code - 01.0101010702-02

RESOURCE MATERIALS

Books -

1. Handbook of Tropical Aquarium Fishes, Axelrod & Schultz (McGraw-Hill 1955)
2. Freshwater Tropical Aquarium Fishes, Hervey & Hems (Batchworth)
3. Tropical Fish, Mann (Sentinel Books Publishers, Inc.)
4. Exotic Aquarium Fishes, Innes (T.F.H. Publications)
5. 1001 Answers to Questions About Aquarium Fishes, Mellen & Robert (Grosset & Dunlap 1935)
6. The Complete Aquarium, Vogt & Wermuth (Arco Publishing Co.)

Periodicals -

1. The Aquarist and Pond Keeper (Brentford, Middlesex)
2. The Aquarium Journal (magazine of the San Francisco Aquarium Society)
3. Aquarium (Philadelphia, Pa.)

DEFINITIONS

1. Dorsal Fin - located in center back of fish body - generally a single fin - exceptions: Darters and Sleepers have double, Cod and Haddock triple fin

2. Adipose Fin - some fish have a strong dorsal fin and a fleshy, smaller, weaker fin behind it - the adipose fin - found in such fish as Cat fishes, Salmon and Characins

3. Caudal Fin - the tail fin - generally single but in certain (ex-fancy Gold Fish) - tail fin is double - used to propel fish through H_2O

4. Anal Fin - located on bottom side of fish this fin is generally single - exception: Cod has double

5. Ventral Fins - one ventral fin on either side of underneath of fish's body - used for steering fish through H_2O

6. Pectoral Fin - fins on sides, behind gills and are always single - used to maintain equilibrium

7. Lower Jaw or Mandible - Some fish have no teeth in jaws - they have teeth in throat or tongue or none at all - fish teeth are of several types - blunt, sharp, mosaic, etc. -
8. Upper Jaw or Maxillary - many fish grow new teeth when they get old or broken

9. Opercle or Operculum - the covering of the gills - gills used to breath with by extracting O_2 from water through them

10. Caudal Penduncle - postier (behind) to anal fin - actual support for tail - directly in front of base of caudal fin

11. Base of Caudal - where tail fin adjoins body of fish - this begins fleshy part of fish as opposed to oftentimes spiny texture of tail fin

12. Lateral Line - believed to be a sense organ though exact function eludes us - distributes oil over fish body - may help fish to detect vibrations which indicate approaching objects - some fish have none, others 2 or 3

13. Head -

14. Snout -

15. Eye - Note for interest: the Flounder or Flatfish hatch with eye on either side so both are on one side, then fish sinks to bottom of water and swims on one side - color vision - scientists find fish able to distinguish a limited spectrum, i.e., food colors or color of fish nets

16. Nostrils -

NOTE: There are some 30,000 known species of fish - new ones being found almost weekly through world - estimated 600 pigmy species suitable for home aquariums and about 300 are available in United States

Fins - When in good health fins, especially dorsal, are raised
When in poor health, lowered

MODULE OF INSTRUCTION

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS Code - 01.01010702-03

DESCRIPTION:

The student will identify and handle the different types of non-poisonous reptiles and amphibians normally found in laboratories or pet stores. The identification will include the ability to recognize the different species within each group of reptiles or amphibians. The student will select the housing requirements which include temperature, humidity, area and terrain of cage of each group being studied. The student will select the feed and water requirements of the various groups of reptiles and amphibians and methods of natural and force feeding. The student will recognize some of the common diseases and problems of reptiles and amphibians in captivity. With the diseases the student will learn some of the basic treatments and preventive measures for those commonly encountered. The student will be able to explain some of the methods used to breed reptiles and amphibians in captivity and the rearing of the young.

DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Handling frogs and toads	1	3
2. Handling lizards	1	5
3. Handling turtles and tortoise	1	5
4. Handling snakes	1	10
5. Handling salamanders	1	2
	5	25

Revised April, 1975

MODULE OF INSTRUCTION

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

Code - 01.01010702-03

OBJECTIVES to be obtained:

The student will be able to:

1. Identify by common name eight frogs and toads.
2. Handle, feed and sex one frog or one toad.
3. Identify the needed environment and set up living quarters for frogs and toads.
4. Identify common problems of frogs and toads in captivity.
5. Care for tadpoles through adult stage.
6. Identify by common name six types of lizards.
7. Handle, feed and sex one lizard.
8. Identify environmental needs and set up living quarters for lizards.
9. Identify common problems of lizards in captivity.
10. Identify by common name 10 types of turtles and tortoises.
11. Handle, feed and sex one of each type of turtle and/tortoise.
12. Identify proper environmental needs and set up living quarters for turtle/tortoises.
13. Identify common problems of turtles and tortoises.
14. Identify by common name five common poisonous snakes of U.S.A. and five common nonpoisonous snakes of U.S.A.
15. Handle and feed a nonpoisonous snake.
16. Set up cage/living quarters for one nonpoisonous snake.
17. Identify common problems of snakes.
18. Identify by common name five types of common salamanders.
19. Handle and feed a salamander.
20. Identify and prepare the proper environment for various salamanders.
21. Identify common problems of salamanders.

Code - 01.01010702-03

AGRICULTURAL

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Handling frogs and toads Objective 1 Identify and name eight frogs and toads.	A. Types of frogs . Green frog . Leopard frog . Pickerel frog . Bullfrog . Wood frog . Tree frog . Spadefoot toad . Fowlers . American common toad . Giant toad
Objective 2 Handle, feed and sex one frog or toad.	A. Feeding . Mealworms . Flies . Grasshoppers . Crickets . Other insects B. Sexing--common types . Bullfrog . Greenfrog . Mink frog . Bronze frog . Eastern green toad
Objective 3 Identify the needed environment and set up living quarters for frogs and toads	A. Tanks--different sizes/cages . Soil . Gravel . Rocks . Plants . Heating . Lighting

EDUCATION

01.01010702-03 - Code

CARE AND HANDLING OF REPTILES AND AMPHIBIANS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Texts/pictures or slides . Live specimens . Demonstrations . Field trips to pet shops, zoos	A. Study identification of frogs and toads	A. Oral or written test. Select and name four frogs and four toads.
A. Handling frogs and toads . Example: A bullfrog like other amphibians is slippery. Encircle its waist with your fingers so it cannot kick itself free. Any large or medium sized frogs may be held in the same way, but small frogs are best grasped by legs. B. Feeding--demonstrate and list types of food. C. Sexing common frogs and toads . Frogs: Example, Bullfrog, the tympanum (ear drum) is larger than eye in males, and only the size of the eye or smaller in females.	A. Handle various frogs and toads . . Feed various frogs and toads . Sex common frogs and toads	A. Instructor's evaluation of student's ability to handle, feed and sex one toad or frog without assistance.
A. Texts . Laboratory exercises in aquarial/terrarium set ups for frogs and toads B. Field trips to pet shops and or zoos	A. Set up various living quarters for frogs and toads.	A. Identify the needed environment and set up proper living quarters for either a frog or toad.

OBJECTIVES BY UNIT	CONTENT
Objective 4 Identify one common problem of frogs or toads in captivity.	A. List of problems (common) frogs and toads . Overpopulation . Improper living quarters . Overfeeding . Underfeeding
Objective 5 State care for tadpoles through adult stage	A. Media . Aquarium tank--assorted sizes . Gravel . Plants . Food--live or dried . Rocks
Objective 6 Students will identify by common name six types of lizards	A. Common names . Skinks and whiptails . Iguana family . Tree and spiny lizards . Eastern collared lizard . Gecko family . Glass lizards . Worm lizards
Objective 7 Handle, feed, and sex one lizard	A. Items needed . Live specimens . Gloves . Feeding--omnivore,carnivore,herbivore . Sexing common types according to color and size

EDUCATION

01.01010702-03 - Code

CARE AND HANDLING OF REPTILES AND AMPHIBIANS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate common problems so students are aware of each type.	A. Students will correct problems in living quarters set up by instructor and state what was wrong.	A. Identify one common problem of frog or toad in captivity.
A. Demonstrate care and placement of tadpole in aquarium tanks. Same as tropical.	A. Students will set up and care for tadpoles in an aquarium.	A. State care of tadpoles through adult stage.
A. Texts/movies or slides. Laboratory exercises in identification and field trips to local pet shops or zoos.	A. Study identification of lizards by use of live specimens or pictures.	A. Student will identify by name six types of lizards.
A. Lizards are best immobilized by holding their feet but the body should also be gripped to prevent sudden lunges. Make it a practice never to grab or hold a lizard by the tail, for it may break right off in your hands.	A. Handle various lizards . Feed various lizards . Sex common lizards	A. Students will handle, feed and sex probably from memory.

Code - 01.01010702-03

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

OBJECTIVES BY UNIT	CONTENT
Objective 8 Identify environment and set up living quarters for lizards.	A. Materials . Tanks--different types/cages . Soil . Gravel . Rocks . Plants . Heat . Light
Objective 9 Identify common problems of lizards in captivity	A. Problems . Overpopulation . Improper living quarters . Over feeding . Under feeding . Parasites (mites)
Unit 3 - Handling Turtles and Tortoises Objective 10 Identify by common name 10 types of turtles and tortoise	A. Types . Snapping turtles . Musk and mud turtles . Water turtles . Box turtles . Map turtles & sawbacks . Painted turtles . Gopher tortoises
Objective 11 Handle, sex and feed one of each type turtle and tortoise.	A. Gloves B. Tanks/cages C. Food-live/dead and greens D. Sexing turtles and tortoises . Color . Shape . Skin areas
Objective 12 Identify proper environment and set up living quarters for turtles and tortoise	A. Utensils . Tanks, all types/cages . Soils . Water . Rocks . Plants . Heat . Light
Objective 13 Identify common problems of turtles and tortoise	A. Problems of living . Cannibalism . Over population . Improper living quarters . Parasites . Feeding

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Texts . Laboratory exercises in terrarium set ups for lizards. . Field trips to pet shops and zoos	A. Set up terrarium for various lizards.	A. Oral or written test Identify and set up living quarters for lizards.
A. Demonstrate and correct problems so students are aware of different situations	A. Students will correct problems in living quarters set up by instructor and state what was wrong.	A. Oral or written test Identify and correct one problem that might occur in a terrarium with lizards.
A. Texts/movies or slides . Live specimens . Field trips to pet shops and zoos	A. Study identification of turtles and tortoises	A. Identify by common name ten types of turtles and tortoises.
A. Handling demonstrated; use of gloves and proper holding so turtle can't bite. . Feeding--what each type turtle/tortoise eat . Sexing turtles/tortoise . Texts/pictures	A. Handle various types of turtles and tortoise . Feed . Sex	A. Teacher's evaluation. Handle,feed and sex one of each type turtle and tortoise.
A. Texts/movies or slides. . Laboratory exercises in terrarium set up for turtles and tortoise.	A. Student will set up terrarium or aquarium for turtles and tortoise.	A. Teacher's evaluation Set up an aquarium or terrarium for a turtle or tortoise.
A. List and explain common problems	A. Students will solve problems set up by instructor.	A. Teacher's evaluation Identify from set up situations,problems of turtles/tortoise. Correct these problems.

Code - 01.01010702-03

AGRICULTURAL

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Handling Snakes Objective 14 Students will identify by common name five common poisonous snakes of U.S.A. and five common non-poisonous snakes.	A. Poisonous snakes (venomous) . Copperhead . Cottonmouth . Coral snake . Rattlesnakes . Massasauga B. Non poisonous (harmless) . Garter snakes . Green snakes . Dekay snakes . Water snakes . Ringneck . Indigo . Black pacers . Hognose . Milk snake . Corn snake
Objective 15 Handle and feed a non poisonous snake.	A. Materials and equipment . Live specimens nonpoisonous snakes . Gloves . Snake stick or snare . Bags . Tank/terrarium . Feed--live/dead
Objective 16 Set up cage/living quarters for one nonpoisonous snake	A. Materials .Tanks--all types/cages .Gravel .Soil .Plants .Rocks .Wood .Heat .Light .Gloves
Objective 17 Identify one common problem of snakes.	A. Problems . Parasites (mites) . Mouth rot . Cuts . Sores

E D U C A T I O N

01.01010702-03 - Code

CARE AND HANDLING OF REPTILES AND AMPHIBIANS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Texts/movies or slides . Charts . Live specimens . Field trips, pet shops, zoos	A. Identification of poisonous and nonpoisonous	A. Identify five poisonous and five non poisonous snakes of U.S.A.
A. Demonstrate handling non poisonous snakes (live specimens) B. Feeding live food/dead food . Worms . Rats . Frogs . Toads . Fish . Salamanders . Mice	A. Handling of various non poisonous snakes. B. Feeding-live/dead food	A. Handle, feed, type of non poisonous.
A. Texts/movies or slides . Laboratory exercises in terrarium set ups for snakes	A. Students will set up terrarium	A. Set up terrarium for one non poisonous snake
A. List and explain common problems . Texts/movies	A. Students will identify and solve problems set up by instructor	A. Identify one common problem of snakes in captivity.

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Handling salamanders Objective 18 Identify by common name five types of common salamanders.	A. Types . Red back . Jefferson . Tiger . Marbled . Dusky . Northern shovelnose . Newts . EFT0
Objective 19 Handle and feed a salamander	A. Salamanders . Feed live and dead insects . Aquariums/terrariums
Objective 20 Identify and prepare proper environment for various salamanders.	A. Terrariums . Soil . Gravel . Light . Heat . Plants
Objective 21 Identify common problems of salamanders.	A. Problems . Rot . Starvation . Parasites . Aqua/terrarium set ups

EDUCATION

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CARE AND HANDLING OF REPTILES AND AMPHIBIANS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Texts/movies or slides . Live specimens . Field trips, pet shops	A. Study identification of common salamanders . Live/pictures	A. Oral or written test . Identify five types of common salamanders from memory.
A. Demonstrate feeding and proper handling of salamanders	A. Students will feed and handle various types of salamanders	A. Teacher's evaluation- Handle and feed one type of salamander
A. Demonstrate setting up living quarters for salamanders and use of equipment	A. Set up one terrarium each to house salamanders	A. Teacher's evaluation- Identify and prepare one terrarium for salamanders from memory
A. List problems of salamanders . Texts/live specimens	A. Students will study and recognize common problems	A. Teacher's evaluation- Identify one common problem in salamanders and solve the problem

MODULE OF INSTRUCTION

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS   Code - 01.01010702-03

RESOURCE MATERIALS

Books:

The Reptile World
Clifford H. Pope
Alfred A. Knopf, New York

The Biology of the Amphibia
G. K. Noble
Dover Publications, New York

A Field Guide to Reptiles and Amphibians
Roger Conant
Houghton Mifflin Co., Boston, Mass.

Our Small Native Animals: Their Habits and Care
Robert Snedigar
Dover Publications, New York

Keeping Reptiles and Amphibia (1950)
E.J.F. Pitman
Buckley Press, Brentford, Middlesex
2S. IOD.

Handbook of Turtles
A. Carr
Comstock Publ, Cornell, N.Y.

The UFAW Handbook on the Care and
Management of Laboratory Animals
pub. by: E&S Livingstone
LTD London

Audiovisuals:

2" by2" kodrachrome slides may be obtained from the biological supply houses such as:

Turtox Biologicals
Chicago, Ill.

Ward's Biological
Rochester, New York

Carolina Biologicals or Clay Adams

Films:

The Frog
Encyclopedia Britannica Educational Corp.
Chicago, Ill.

MODULE OF INSTRUCTION

Title - CARE AND HANDLING OF SMALL ANIMALS Code - 01.0101010702-04

DESCRIPTION:

The student will learn methods of identification and handling of the different types of small rodents, guinea pigs, and rabbits. Identification will include the ability to recognize the various strains of each species. The handling will include the ability to determine the sex of the animals from the newborn through the adult stages. By learning the behavioral patterns of the various animals the student will begin to develop an understanding of the animals' needs. This understanding will enable the student to select the proper methods of caging, feeding, and watering of the animal studied. The student will be able to recognize the symptoms of some of the common diseases of small animals.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Identification and handling of rodents	1	7
2. Sex determination of rodents	0	2
3. Identification and handling of guinea pigs	0	2
4. Identification and handling of rabbits	0	2
5. Animal behavior	0	6
6. Housing and feeding small animals	1	5
7. Disease symptoms	1	3
	3	27

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Revised August '75

MODULE OF INSTRUCTION

Title - Care and Handling of Small Animals

Code - 01.0101010702-04

OBJECTIVES to be obtained:

The student will be able to:

1. Identify the 10 common strains of rats, mice, hamsters, and gerbils used as pets or laboratory animals.
2. Handle rats, mice, hamsters and gerbils in a pet store or lab setting.
3. Determine the sex when given a rodent in any stage of its development, from newborn through adult.
4. Identify the common strains or breeds of guinea pigs.
5. Handle and sex the common strains or breeds of guinea pigs.
6. Identify,handle and sex the common strains of rabbits.
7. Record behavioral patterns of the small animals being studied.
8. List the recommended equipment needed for housing small animals.
9. List the various methods of caging, feeding and watering the small animals.
10. Recognize the symptoms of 20 common diseases of small animals, and relate a cause and control for each.

Code - 01.0101010702-04

Title - Care and Handling of Small Animals

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identification and Handling of rodents Objective 1 Identify the common strains of rats, mice, hamsters, and gerbils used as pets or laboratory animals.	A. Rats . Identification of common strains B. Mice . Identification of common strains C. Hamsters D. Gerbils
Objective 2 Handle rats, mice, hamsters and gerbils in a pet store or laboratory setting	A. Techniques of handling . Rats . Mice . Hamsters . Gerbils B. Safety . Animal's . Handler's
Unit 2 - Sex Determinations of Rodents Objective 3 Determine the sex when given a rodent in any stage of development from newborn through adult.	A. Adult . Rats . Mice . Hamsters . Gerbils B. Newborn . Rats . Mice

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion B. Supervised study using references	A. Participate in class discussion B. Take notes during lecture C. Compile list of names of each animal and a method of identifying each in the notebook - include photographs.	A. Oral or written test Identification of animals by strain or breed.
A. Lecture - discussion B. Slide presentation - Animal Handling Care C. Teacher demonstration D. Supervised practice E. Film strip - Safe Handling of Lab Animals	A. Take notes B. Observe demonstration C. Practice what has been demonstrated	A. Teacher evaluation of student's ability to handle rats, mice, hamsters, and gerbils.
A. Class discussion B. Demonstration C. Supervised practice	A. Note taking B. Observe demonstration C. Practice sexing each animal	A. Teacher evaluation of student's ability to sex a rodent.

Code - 01.0101010702-04

Title - Care and Handling of Small Animals

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Identification and Handling of Guinea Pigs Objective 4 Identify the common strains or breeds of guinea pigs	A. Use B. Particular adaptation C. Color markings D. Size
Objective 5 Handle and sex the common strains or breeds of guinea pigs.	A. Techniques of handling guinea pigs B. Sexing guinea pigs C. Safety
Unit 4 - Identification and Handling Rabbits Objective 6 Identify, handle and sex the common strains of rabbits	A. Identification of the common strains or breeds of rabbits. B. Techniques of handling rabbits C. Sexing rabbits D. Safety

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study	A. Compile a list of the common strains of guinea pigs and note methods of identification.	A. Teacher's evaluation of student's ability to identify different strains of guinea pigs.
A. Teacher demonstration with live animals B. Supervised practice	A. Observe teacher's demonstration. B. Practice handling and sexing guinea pigs.	A. Teacher evaluation of student's ability to handle and sex guinea pigs.
A. Demonstration with live animals. B. Supervised study - references C. Supervised practice	A. Compile lists of common strains for identification in notebook. B. Observe teacher demonstration C. Practice sexing rabbits.	A. Oral or written test B. Identification of rabbits. C. Teacher evaluation of student's ability to handle and sex rabbits.

Code - 01.0101010702-04

Title - Care and Handling of Small Animals

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Animal Behavior Objective 7 Record behavioral patterns of the small animals being studied.	A. Normal cage activities . Docile . Active . Curious . Nesting . Fighting . Breeding . Animal's activities at night and during the day. B. Effects of various stimulations . Light . bright . prolonged . Noise . sudden . at various frequencies . Sudden movements . Temperature changes . Various odors . sweet . sour or foul . masking odors . smoke C. Ability of animals to learn . By reward . To avoid punishment
Unit 6 - Housing and Feeding Small Animals Objective 8 List the recommended facilities needed for housing small animals.	A. Building . Sanitary . Pest proof . Environmental controls . Cleaning equipment B. Room sizes C. Walls and floors

EDUCATION

01.0101010702-04 - Code

Care and Handling of Small Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion B. Prepare laboratory setting C. Prepare mimeo of items to be observed D. Supervised laboratory study E. Laboratory exercises to determine the effects of the various stimulations on the animals, designed to test each stimulation separately and in combination. F. Laboratory exercises using various training devices, maze, skinner box, to determine the animals ability to learn. G. Keeping records on the laboratory exercises.	A. Note taking B. Use mimeo as a guide C. Study and record behavioral patterns. D. Observe the learning abilities and classify the animals observed.	A. Teacher evaluation of student's record of behavioral patterns. B. Teacher evaluation of student's ability to recognize normal and abnormal types of behavioral.
A. Supervisory study B. Class discussion	A. Prepare information and pictures for notebook.	A. Teacher evaluation of student's notebook.

Code - 01.0101010702-04

Title - Care and Handling of Small Animals

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Objective 9 List the various methods of caging, feeding, and watering small animals.	A. Cage size requirements for different animals B. Types of cages . Shoebox . Wire basket . Cage materials . plastic or glass . metal . wood C. Types of bedding . For incage use . For dropping pans D. Types of feeding and watering devises E. Feeding and watering requirements of the different small animals
Unit 7 - Disease Control Objective 10 Recognize the symptoms of 20 common diseases of small animals and relate a cause and control to each.	A. Causes B. Symptoms . Rough and starry coat . Abnormal behavior . Discharge about eyes or nose . Diarrhea or messy stool . Blood in cage and/or wounds . Tilts head to one side . off balance or spins in circles . Lack of color in ears . Abnormal growths C. Controls D. Safety - handler

EDUCATION

01.0101010702-04 - Code

Care and Handling of Small Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Field trips C. Supervised study	A. Participate in discussion B. Compile and record notes on various methods of caging, feeding and watering small animals.	A. Teacher evaluation of notes. B. Oral or written test. C. Cage requirements and types of cage bedding, watering and feeding mechanisms. D. Food requirements
A. Class discussion B. Supervised study C. Supervised practice	A. Participate in class discussion. B. Compile list of causes, symptoms, and controls of 40-50 diseases for future references. C. Prepare program for disease prevention.	A. Teacher's evaluation of student's listing B. Oral or written test

MODULE OF INSTRUCTION

Title - Handling Small Animals   Code - 01.0101010702-04

RESOURCE MATERIALS

Books:

The UFAW Handbook
Care and Management of Laboratory Animals
Edited by staff of UFAW
3rd edition
E. & S. Livingstone LTD
England $22.00

The I.A.T. Manual of Laboratory Animal Practice and Techniques
D. J. Short & D. P. Woodnott
2nd edition
Charles C. Thomas
Springfield, Illinois $14.00

Raising Laboratory Animals
James Silvan
The Natural History Press
Garden City, N.Y. $1.45

Manual for Laboratory Animal Technicians
Publication 67-3
American Association for Animal Science
Joliet, Illinois $3.00

Periodicals:

Laboratory Animal Digest
Ralston Purina Co.
St. Louis, Missouri

Laboratory Animal Care
American Association for
Laboratory Animal Science
Joliet, Illinois

Audiovisuals: Films

Handling Laboratory Animals
American Association for
Laboratory Animal Science
Joliet, Illinois

Care of Laboratory Animals (filmstrip)
National Medical Audiovisual Center
Chamblee, Georgia

Using Animals in the Laboratory (filmstrip)
National Medical Audiovisual Center
Chamblee, Georgia

Safe Handling of Laboratory Animals
National Medical Audiovisual Center
Chamblee, Georgia

2" x 2" Kodachromes
Animal Handling and Care
(Now in Process by American Association
for Laboratory Animal Science)
Joliet, Illinois

MODULE OF INSTRUCTION

Title - HANDLING OF PRIMATES   Code - 01.0101010702-05

DESCRIPTION:

The student will learn methods to identify and handle the different species of primates. The identification will include the species classification, the sex of the animal and the methods of tattooing or marking the individual animals. The handling will include the use of the various types of cages, nets, protective clothing and other devices used in safely restraining primates. The student will begin to develop an understanding of the needs of primates. This understanding will enable the student to learn caging, feeding and watering and cleaning of the primates. The student will be made aware of the common diseases of primates.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Other
1. Types	1	2
2. Conditioning	1	4
3. Handling	1	9
4. Care and Sanitation		10
5. Diseases	1	1
	4	26

Revised August 1975

MODULE OF INSTRUCTION

Title - HANDLING OF PRIMATES

Code - 01.0101010702-05

OBJECTIVES to be obtained:

The student will be able to:

1. Identify without reference 12 different classes of primates and determine the sex of 6 different primate animals.

2. Tattoo or mark the individual primates for identity and perform job necessary for receiving new animals.

3. Use restriction equipment to capture and restrain a primate without causing injury.

4. Feed and water the different species of primates.

5. Maintain sanitary conditions of the primate quarters.

6. List 30 common diseases of primates and prepare a record of causes, symptoms and controls for 20 of these.

Code - 01.0101010702-05

Title - HANDLING OF PRIMATES

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Types Objective 1 Identify without reference 12 different classes of primates and determine the sex of 6 different primate animals.	A. Identification . Species . Sex B. Native homes . Origin . Migration
Unit 2 - Conditioning Objective 2 Tatoo or mark the individual primates for identity and perform job necessary for receiving new animals	A. Procurement . Direct import . Breed in captivity . Handling upon arrival B. Isolation . Weighed, sexed . Examined for TB and other signs of diseases . Isolation area and sanitary precautions C. End of isolation period . Placed in animal colony
Unit 3 - Handling Objective 3 Use restriction equipment to capture and restrain a primate without causing injury	A. Squeeze cage B. Nets C. Chains D. Tranquilizing or anesthesia E. Hand catching . Grips . oral medication . tattooing . blood drawing . other procedures F. Safety

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion B. Teacher demonstrations C. Supervised study D. Film-Survey of Primates	A. Compile notes-list of classes and species B. Observe demonstration C. Sex the animals	A. Teacher evaluation of students ability to determine sex. B. Oral or written test List 12 classes of primates and give 2 identifying characteristics of each
A. Teacher demonstration in isolation room B. Supervised study C. Supervised practice	A. Compile notes of jobs necessary for procuring animals B. Observe teacher demonstrations of receiving and preparing animals C. Observe teacher demonstration of tatooing D. Practice observed procedure	A. Teacher evaluation of students ability to apply tatoo and prepare for new arrivals
A. Teacher demonstration of various types of equipment B. Teacher demonstration of the various grips and procedures used C. Teacher demonstration of various procedures using live animals. D. Supervised practice on models and live animals	A. Observe teacher demonstrations B. Practice each demonstrated technique	A. Teacher evaluation of students ability to restrain animals

Code - 01.0101010702-05

Title - HANDLING OF PRIMATES

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Care and Sanitation Objective 4 Feed and water the different species of primates	A. Basic Nutrition . Foods used by primates . Nutrients available in these foods . Nutritional needs of primates (NOTE: this is not a unit in nutrition) B. Feeding . Labeling particular foods for particular animals . Measuring amount to be fed . Schedule . Record of feeding C. Watering . Periodic . Free water
Objective 5 Maintain sanitary conditions of primate quarters	A. Temperature, humidity and light B. Caging--individual or colony . Types . Sanitation . cage . quarters . personnel
Unit 5 - Disease Control Objective 6 List 30 common diseases of primates including causes, symptoms and controls of each	A. Infections B. Contagious C. Contagious to humans D. Prevention E. Symptoms . Lesions and wounds . mouth and tongue . superficial cuts or abrasions . bites . Stool and urine specimens

01.0101010702-05 - Code

HANDLING OF PRIMATES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Demonstration by teacher C. Supervised practice D. Field trip to zoo or pet store	A. Note taking--list of foods categorized to animals B. Observe demonstration C. Practice feeding and watering primate animals	A. Teacher evaluation of students ability to feed animals
A. Lecture--discussion B. Supervised study C. Demonstration of procedures D. Supervised practice E. Field trip	A. Note taking B. Prepare a list of procedures to follow for daily sanitation C. Prepare a list of sanitation for new arrivals D. Observe demonstration E. Practice demonstrated techniques	A. Oral or written test B. List daily sanitary procedures C. Teacher evaluation of students ability to use sanitary practices
A. Supervised study . Set up students in groups with responsibility for a set number of diseases to each group. Let the group report their information to the class. B. Guest speaker-veterinarian	A. Compile a list of causes, symptoms and controls for each disease reported B. Discuss problems to speakers	A. Oral or written test .Causes,symptoms and controls for 10 diseases B. Teacher evaluation of the 30 listed diseases as recorded

C. Periodicals -

Laboratory Animal Digest
Ralston Purina Co
St. Louis, Missouri

Laboratory Animal Care
American Association for
Laboratory Animal Science
Joliet, Illinois

Laboratory Primate Newsletter
Psychology Department
Brown University
Providence, Rhode Island

D. Audiovisuals

Films

Survey of the Primates
Appleton Century Crofts Film Library
New York (rental $30.00)

The Rhesus Monkeys of Santiago Island, Puerto Rico
National Medical Audiovisual Center
Chamblee, Georgia

Characteristics of Gibbon Behaviour
Psychological Cinema Register
Audio-Visual Aids Library
Pennsylvania State University
University Park Penn.

Behavioral Characteristics of the Rhesus Monkey
Psychological Cinema Register
Audio-Visual Aids Library
Pennsylvania State University
University Park, Penn.

MODULE OF INSTRUCTION

Title - INTERNAL PARASITES OF ANIMALS

Code - 01.0101010703-01

DESCRIPTION:

The student will learn to identify the numerous internal parasites of animals. Students will learn the techniques used for the preparation of specimens for studying the intestinal or blood parasites using a microscope, and for identification of most parasitic infections. The student will learn the simple staining procedures used in the identification of some parasites, and to identify the parasite by use of the egg, cyst, larvae or adult morphology. The student will learn methods of collecting and transporting specimens for parasitic analysis.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Collection and Transportation of Specimens	1	4
2. Identification of Parasitic Nematodes	0	8
3. Identification of Cestodes and Trematodes	0	6
4. Identification of Parasitic Protozoa	1	10
	2	28

August '75

MODULE OF INSTRUCTION

Title - Internal Parasites of Animals Code - 01.0101010703-01

OBJECTIVES to be obtained:

The student will be able to:

1. Collect specimens from animals for parasitic analysis.
2. List the proper methods of transporting specimens including mailing regulations.
3. Prepare specimens for parasitic analysis using direct smears, flotation, and sedimentation concentration techniques.
4. Stain smears using Giemsa, Wright's Iodine or Trichrome stains.
5. Properly use a microscope.
6. Identify the common Nematodes (roundworms) of animals based upon the adult, larvae, or egg stages.
7. Identify the common Cestodes (tapeworms) of animals based upon the adult, larvae, or egg stages.
8. Identify the common Trematodes (flukes) of animals based upon the adult and egg stages.
9. Identify the common parasitic Protozoa of animals based upon the trophozoite or cysts stages.

Code - 01.0101010703-01

Title - Internal Parasites of Animals

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Collection and Transportation of Specimens Objective 1 Collect specimens from animals for parasitic analysis.	A. Collecting specimens samples . Fecal . Urine . Blood . Tissue
Objective 2 List the proper methods of transporting specimens including mailing regulations.	A. Transportation of specimens . Short distances . Long distances . mailing specimens
Objective 3 Prepare specimens for parasitic analysis using smears, flotation, and sedimentation concentration techniques.	A. Simple concentration techniques . Direct smears . Flotation methods . Sedimentation methods

E D U C A T I O N

01.0101010703-01 - Code

Internal Parasites of Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Teacher demonstration C. Movies D. Laboratory exercises	A. Collect fecal, urine, and blood samples for parasitic analysis. B. Take notes on supervised study questions, teacher demonstrations, and movies. C. Keep laboratory exercises current.	A. Written examination B. Performance grade on laboratory techniques C. Test using unknowns of fecal, urine, blood and tissue samples.
A. Teacher-student discussion B. Invite resource person to class to discuss transportation methods and techniques. C. State and Federal regulations.	A. Student notes	A. Oral quiz B. Essay quiz on transporting specimens
A. Laboratory demonstrations B. Laboratory exercises C. Slides	A. Student notes on laboratory techniques B. Prepare reports using school animals and laboratory exercises regarding parasitic studies. C. Stain slides for parasitic studies.	A. Laboratory techniques and performance grading B. Notebook grade

OBJECTIVES BY UNIT	CONTENT
Objective 4 Stain smears using Giemsa, Wright's Iodine or Trichrome stains.	A. Staining techniques . For intestinal protozoa . iodine . trichrome . Blood smears . Wrights stain . Giemsa stain
Objective 5 Properly use a microscope.	A. The parts of a microscope B. Adjusting the microscope . Low power . High power C. Preparing slides
Unit 2 - Identification of Parasitic Nematodes Objective 6 Identify the common Nematodes (roundworms) of animals based upon the adult, larvae, or egg stages.	A. Intestinal nematodes . Identification stages . adult . egg . larvae

EDUCATION

01.0101010703-01 - Code

Internal Parasites of Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher demonstrations B. Students laboratory exercises	A. Notes on laboratory exercises	A. Oral quiz on staining techniques. B. Notebook grade - laboratory exercises.
A. Demonstrations B. Microscope charts C. Laboratory exercises	A. Student notes B. Student skill development using the microscope.	A. Written test B. Performance test
A. Demonstrations B. Laboratory exercises C. Teacher - student discussions	A. Laboratory exercises in identification of common parasitic nematodes.	A. Laboratory test . Methods . Techniques . Identification using unknown samples.

Code - 01.0101010703-01

Title - Internal Parasites of Animals

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Identification of Cestodes and Trematodes Objective 7 Identify the common cestodes (tapeworms) of animals based upon the adult, larvae, or egg stages.	A. Identification of cestodes (tapeworms) . Adult stages . Egg stages . Larvae stages
Unit 4- Identification of Parasitic Protozoa Objective 8 Identify the common trematodes (flukes) of animals based upon the adult, and egg stages.	A. Identification of intestine protozoa . Amebae . Flagellates . Ciliate . Sporozoa B. Identification of protozoa found in the blood . Flagellates . Sporozoa
Objective 9 Identify the common parasitic protozoa of animals base upon the trophozoite or cysts stages.	A. Identification of common parasitic protozoa . Cysts stages

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Film strips and slides C. Movies D. Teacher/student discussion.	A. Notes on supervised study period, slides, movies and class discussion.	A. Test on laboratory exercises.
A. Demonstrations B. Laboratory exercises C. Classroom discussion	A. Identify the common trematodes (flukes) of domestic and laboratory animals. B. Student notes	A. Test on laboratory exercises B. Notebook grade
A. Demonstrations B. Laboratory exercises C. Slides	A. Students sketch types of protozoa based on cyst stages. B. Prepare slides for visuals.	A. Laboratory exercise test Identification of common parasitic protozoa of domestic and laboratory animals.

MODULE OF INSTRUCTION

Title - Internal Parasites of Animals

Code - 01.0101010703-01

RESOURCE MATERIALS

Books:

Veterinary Clinical Parasitology
Margaret W. Sloss
4th edition
Iowa State University Press
Ames, Iowa

How to Know the Tapeworms
Gerald D. Schmidt
Wm. C. Brown Company
Dubuque, Iowa

Veterinary Helminthology
Angus M. Dunn
Lea & Febiger
Philadelphia

Animals Parasitic in Man
Geoffrey Lapage
Dover Publications
New York

How to Know the Trematodes
Schell
Wm. C. Brown Company
Dubuque, Iowa

Protozoology
R. R. Kudo
Charles Thomas
Springfield, Illinois

Introduction to Parasitology
A. C. Chandler
John Wiley & Sons
New York

Animal Parasitology Laboratory Manual
Noble and Noble
Lea & Febiger

Periodicals:

Laboratory Animal Digest
Ralston Purina Co.
St. Louis, Missouri

Laboratory Animal Care
American Association of Laboratory
Animal Science
Joliet, Illinois

Audiovisuals:

The following films can be obtained from:
National Medical Audiovisual Center (Annex)
Chamblee, Georgia 30005

M-115 Ancylostoma caninum in the intestine of the dog
Collection of fecal specimens F-81
M-761 Formalin-Ether Sedimentation Technique
5-073 Hookworm disease and hookworm infection
4-059 Infection larvae of Wochereria bancrofti

RESOURCE MATERIALS (cont'd)

Audiovisuals(cont'd)

5-155 The Preparation of Hemstoxylin stained smears for the diagnosis of intestinal protozoa
5-153 PVA - fixative technique in the diagnosis of amebiasis
5-095 Worms in your muscles

* *

Ancylostoma: Life history of hookworms
McGraw Hill Book Co. New York, New York

Parasitism (Parasitic Flat Worms)
Encyclopedia Britannica Educational Corp.
Chicago, Illinois

The World Within
Extension Media Center
University of California
Berkeley, California

MODULE OF INSTRUCTION

Title - External Parasites of Animals

Code - 01.0101010703-02

DESCRIPTION:

The student will learn to identify the external parasites and pests of animals and their quarters. Emphasis will be placed on identification and control of the vermin infesting the animals and their quarters. Various techniques for the collecting and preparation of the specimens will be taught. The life cycles of the vermins will be covered in order for the student to have a better understanding of prevention and control methods.

The student will learn to treat, prevent, and control the common vermin problem of animals.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Collection and Preparation of Specimens	1	4
2. Identification of Ticks and Mites	0	8
3. Identification of Fleas and Lice	1	8
4. Identification of Pests of Animal Quarters and Feeds	0	8
	2	28

Revised August '75

MODULE OF INSTRUCTION

Title - External Parasites of Animals

Code - 01.0101010703-02

OBJECTIVES to be obtained:

The student will be able to:

1. Collect 25 different external parasites from both living and dead animals using common procedures.

2. Prepare the specimens including clearing and mounting on slides for identification.

3. Distinguish the differences between the hard and soft ticks and identify 10 common ones found on animals.

4. Recognize 10 of the common mites found on animals.

5. Identify 15 common fleas.

6. Identify 8 common chewing and sucking lice.

7. List and identify 20 common pests of animal quarters and feeds.

8. List the symptoms and methods to control 10 of the common pests of animal quarters.

Code -- 01.0101010703-02

Title - External Parasites of Animals

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Collection and Preparation of Specimens Objective 1 Collect 25 different external parasites from both living and dead animals using common procedures.	A. Collection of specimens . Living animals . birds . mammals . reptiles . Dead animals . cold method . bathing . combing . digestion method
Objective 2 Prepare the specimens, including clearing and mounting on slides for identification.	A. Preparation . Clearing . Mounting
Unit 2 - Identification of Ticks and Mites Objective 3 Distinguish the differences between the hard and soft ticks, and identify the 10 common ones found on animals.	A. Ticks . Soft . Hard

EDUCATION

01.0101010703-02 - Code

External Parasites of Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Demonstration by the instructor C. Supervised practice	A. Collect specimens from both living and dead animals. B. Participate in class discussion.	A. Teacher's evaluation of student's ability to collect insects specimens.
A. Demonstration by the instructor of techniques to be used. B. Supervised practice	A. Participate in class discussion. B. Practice preparation of insects.	A. Teacher's evaluation of student's ability to collect insect specimens.
A. Class discussion B. Supervised study using references . Pictorial keys . A manual for external parasites C. Demonstrate methods of identification of each using a key. D. Supervised practice	A. Participate in discussion B. Compile notes C. Observe demonstration D. Practice identification procedure.	A. Teacher's evaluation of student's ability to differentiate between soft and hard ticks. B. Oral or written test using real specimens for identification.

OBJECTIVES BY UNIT	CONTENT
Unit 2 Objective 4 Recognize 10 of the common mites found on animals.	A. Mites
Unit 3 - Identification of Fleas and Lice Objective 5 Identify 15 common fleas	A. Fleas
Objective 6 Identify 8 common chewing and sucking lice.	A. Chewing . Mouth parts . Area of infestation B. Sucking . Mouth parts . Area of infestation

01.0101010703-02 - Code

External Parasites of Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and class discussion B. Supervised study using . Pictorial keys . A manual for external parasites C. Guest speaker - local veterinarian	A. Participate in discussion B. Compile notes C. Observe demonstration D. Practice identification procedure. E. Mount specimens	Teacher's evaluation of student's ability to identify mites.
A. Class discussion B. Supervised study of types C. Mimeo of names of common fleas. D. Demonstration of identification techniques. E. Supervised practice	A. Participate in class discussion B. File mimeo in notebook C. Observe demonstration D. Practice identification procedures E. Mount specimens	A. Oral or written test - list 15 common fleas. B. Teacher's evaluation of student's ability to identify 15 common fleas.
A. Lecture and discussion B. Supervised study of types. C. Demonstration of identification. D. Guest speaker - local veterinarian E. Supervised practice identifying each.	A. Compile notes B. Practice identification procedure C. Keep a record of each specimen identified. D. Mount specimens	Oral or written test identifying 8 chewing and sucking insects from real specimens, or slide specimens.

Code - 01.0101010703-02

Title - External Parasites of Animals

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Identification of Pests of Animal Quarters and Feeds Objective 7 List and identify 20 common pests of animal quarters.	A. Insects of animal quarters . Roaches . Beetles . Bugs . Wild rodents . signs . controls
Objective 8 List the symptoms and methods to control 10 of the common pests of animal quarters.	A. Insects . Traps . Insecticides . Baits . Cleanliness B. Rodents . Traps . Baits . Natural predators . Cleanliness

EDUCATION

01.0101010703-02 - Code

External Parasites of - Title
Animals

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Guest speaker from pest control company. C. Demonstration of identification of signs of pests. D. Field trip to housing facility.	A. Participate in class discussion. B. Compile notes from guest speaker. C. Identify pests of animal quarters. D. Participate in field trip	Teacher's evaluation of student's list and his ability to identify real specimens of 20 different pests of animal quarters and feeds.
A. Class discussion B. Field trip to housing facility.	A. Participate in class discussion. B. Compile notes on symptoms of pests. C. Solve problems of control of pests. D. Participate in field trip E. Prepare a plan for pest control.	Teacher's evaluation of student plan for pest control for housing and feed facilities.

MODULE OF INSTRUCTION

Title - External Parasites of Animals Code - 01.0101010703-02

RESOURCE MATERIALS

Books:

Medical Entomology
U.S. Naval Medical School
U.S. Government Printing Office
Washington, D. C.

Pictorial Keys
Arthropods, Reptiles, Birds and Mammals of Public Health Significance
U.S. Department of Health, Education and Welfare
Communicable Disease Center
Atlanta Georgia

A Manual of External Parasites
H. E. Ewign
Charles C. Thomas
Springfield, Illinois

Helminths, Arthropods and Protozoa of Domesticated Animals
E.J.L. Soulsby
Williams and Wilkins Co.
Baltimore, Maryland

Periodicals:

Laboratory Animal Care
Official Publication of the American
Association of Laboratory Animal Science
Joliet, Illinois

Laboratory Animal Digest
Ralston Purina Co.
St. Louis, Missouri

Audiovisuals:

Arthropods of Public Health Importance
National Medical Audiovisual Center
Chamblee, Georgia

Biology and Control of Cockroaches
National Medical Audiovisual Center
Chamblee, Georgia

MODULE OF INSTRUCTION

Title - Emergency Care of Animals Code - 01.0101010703-03

DESCRIPTION:

The student will learn to administer first aid to an animal which has been hurt and suffering from shock, bites or wounds, poisonous snake or insect bites, infested or infected by ticks or maggots, or poison. The student will also be able to take the body temperature and respiration of a sick animal. Part of his training will be devoted to recognizing outward signs of sickness such as changes in behavior and body coats. The student will learn how to isolate a sick animal from others and maintain proper care for all the animals without danger of infection from the isolated animal. The student will also learn some of the methods used to prevent infections and infestation in animals.

MAJOR DIVISIONS OR UNITS OF CONTENT	TIME ALLOCATION Class	Other
1. Handling Sick or Injured Animals	0	5
2. First Aid to Animals	2	10
3. Disease Recognition	0	9
4. Disease Prevention and Control	1	3
	3	27

Revised August '75

MODULE OF INSTRUCTION

Title - Emergency Care of Animals

Code - 01.0101010703-03

OBJECTIVES to be obtained:

The student will be able to:

1. Restrain and handle an ill or injured animal using procedures safe to both the animal and handler.
2. Administer first aid to an animal suffering from shock, cut or a bite, or suffering from a foreign body in the mouth, skin or rectum.
3. Administer procedures to relieve an animal suffering from or harboring ticks or maggots.
4. Administer first aid (splint) for a broken bone or bad sprain in an animal.
5. Administer first aid to an animal which has been bitten by a poisonous snake or insect.
6. Apply procedures or a remedy to assist an animal which has been poisoned.
7. Recognize changes in the animals appearance, and behavior.
8. Without error, take an animals temperature.
9. Check and analyze an animals reflexes.
10. Apply preventative procedures to diseased animals by properly isolating sick animals.
11. Observe and select symptoms of an animal routinely to watch for and prevent the spread of diseases.
12. Follow routine treatment procedures to prevent the start or spread of diseases.

Code - 01.0101010703-03

Title - Emergency Care of Animals

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Handling Sick or Injured Animals Objective 1 Restrain and handle an ill or injured animal using procedures safe to both the animal and handler.	A. Simple forms of restraint . Personal approach . Physical devices . dogs . cats . rodents . guinea pigs . rabbits . birds B. Chemical forms of restraint . Injectables . judgment for use C. Safety precautions . Animal attack . Contagious infections . Animal injury
Unit 2 - First Aid to Animals Objective 2 Administer first aid to an animal suffering from shock, cut or a bite, or suffering from a foreign body in the mouth, skin, or rectum.	A. Shock treatment - emergency . Heat stroke . Accidents . fights with other animals . struck by vehicle . inhumane treatment . Foreign bodies . Burns
Objective 3 Administer procedures to relieve an animal suffering from or harboring ticks or maggots.	A. Ticks . Physical removal . Chemical removal B. Maggots

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Class discussion C. Supervised study with references. D. Guest speaker - Lab animal handler. E. Demonstration of simple forms of restraint. F. Supervised practice	A. Note taking B. Participate in class discussion. C. Practice simple forms of restraint demonstrated. D. Practice whenever possible the forms of chemical restraint.	A. Teacher evaluation of student ability to use simple restraint techniques.
A. Supervised study B. Class discussion C. Guest speaker - veterinarian D. Demonstration E. Supervised practice	A. Note taking from study B. Observation of demonstration. C. Practice emergency treatment demonstrated.	A. Teacher evaluation of student ability to administer emergency treatment for accidents and shock.
A. Supervised study B. Demonstration C. Supervised practice	A. Note taking B. Observation of demonstration. C. Practice procedures of removing ticks and maggots.	A. Teacher evaluation of student ability to relieve an animal of ticks or maggots.

OBJECTIVES BY UNIT	CONTENT
Objective 4 Administer first aid (splint) for a broken bone or bad sprain in an animal.	A. Skeletal . Leg bones B. Splints . Wooden . Inflatable . Metal C. Mobility of injured animal
Objective 5 Administer first aid to an animal which has been bitten by a poisonous snake or insect.	A. Snake bites . Tourniquet . Antidote B. Insect bites . Antidotes
Objective 6 Apply procedures or a remedy to assist an animal which has been poisoned.	A. Symptoms . Temperature . Temperament . Alertness B. Discovering the particular poison . Relate symptoms with known poison symptoms . Relate with emergency need for veterinarian's diagnosis C. Administering antidotes

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Class discussion C. Guest speaker - veterinarian D. Demonstration E. Supervised practice	A. Prepare report on splints for particular bones (foreleg or rear leg). B. Practice applying splint to broken bone as demonstrated.	A. Teacher evaluation of student techniques of applying splints.
A. Supervised study B. Class discussion C. Demonstration D. Supervised practice	A. Compile notes • List poisonous snakes • List poisonous insects • List antidotes for each • Prepare a program procedure, 10 examples of poisonous snake bites, and 10 insect bites.	A. Teacher evaluation of student procedure. B. Teacher evaluation of student program procedure to follow in emergency.
A. Guest lecturer - veterinarian. B. Class discussion C. Supervised study in groups of 3 or 4. • Let one group prepare a panel discussion relating to poisonous plants and/or laws pertaining to poisoning animals through deliberate action.	A. Compile notes • List possible poisons • List antidotes • List symptoms • List times needed in emergency B. Prepare panel discussion on laws against poisoning animals.	A. Test listing symptoms and diagnosis of named poisons. Include plants, and prepared poisons.

Code - 01.0101010703-03

Title - Emergency Care of Animals

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Disease Recognition Objective 7 Recognize changes in the animals appearances and behavior.	A. Changes in body coat . Sheen . Roughness . Color B. Behavior . Sluggishness . Spasmatic reactions . Eye reaction
Objective 8 Without error, take an animal's temperature.	A. Thermometer . Rectal B. Handling
Objective 9 Check and analyze an animal's reflexes.	A. Leg pulling B. Touching eye lids C. Others

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Supervised study C. Pictures and slides if available.	A. Compile notes B. Observe any live examples of diseases, and prepare a list of symptoms observed. C. Observe pictures and take notes.	Test on symptoms of diseases and remedy for the diagnosis.
A. Class discussion B. Demonstration C. Supervised practice	A. Participate in discussion B. Observe demonstration C. Practice taking temperatures	Teacher's evaluation of student's ability to take an animal's temperature.
A. Class discussion B. Demonstration C. Supervised practice D. Field trip- Animal Clinic	A. Participate in class discussion. B. Observe discussion C. Observe demonstrated techniques. D. Practice demonstrated techniques.	Teacher's evaluation a student's ability analyze reflexes.

Code - 01.0101010703-03

Title - Emergency Care of Animals

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Disease Prevention and Control Objective 10 Apply preventative procedures to diseased animals, by proper isolation techniques.	A. Disinfecting B. Isolation of animals with contagious diseases. C. Isolation when entering clinic D. Handling methods E. Feeding procedures . Cleanliness of utensils and feeder F. Safety in handling
Objective 11 Observe and select symptoms of an animal, routinely to watch for and prevent the spread of diseases.	A. Categorize diseases . Contagious . Infections . Poisons . Metabolic conditions . Parasites . Mechanical injury
Objective 12 Follow routine treatment procedures to prevent the start or spread of diseases.	A. Prepare outline of treatment routine . Handler's preparation . Equipment . Aseptic procedures . Isolation . Administering antibiotics . Safety

01.0101010703-03 - Code

Emergency Care of Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Class discussion C. Mimeo of procedures D. Supervised study	A. Compile notes B. Participate in discussion C. Outline preventative procedure and proper isolation techniques.	A. Teacher evaluation of outline. B. Teacher evaluation of notebook.
A. Guest speaker - Veterinarian B. Supervised study C. Supervised practice	A. Compile notes B. Practice observing symptoms C. Prepare a list of categorized diseases.	A. Teacher evaluation of student ability to select symptoms. B. Teacher evaluation of student's list of categorized diseases.
A. Class discussion B. Supervised study	A. Participate in class discussion. B. Prepare outline of treatment routine.	A. Teacher evaluation of student procedure.

MODULE OF INSTRUCTION

Title - **Emergency Care of Animals** Code - **01.0101010703-03**

RESOURCE MATERIALS

Books:

The complete Book of Dog Care
L. F. Whitney
Doubleday and Co.
Garden City, New York

First Aid for Pets
L. F. Whitney 1954

Home Veterinarians Handbook
E. T. Baker

Pets
Frances N. Chrystie

MODULE OF INSTRUCTION

Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

Code - 01.0101010703-04

DESCRIPTION:

The student will learn to bath, dip, dust and be able to give medicated baths to various animals, primarily dogs for grooming. Each group of animals, due to their particular habits, require different chemicals and methods for the removal of ectoparasites as well as the treatment for the different type of parasites. The dipping and dusting is primarily for the removal of fleas, lice, ticks or mites. The students will also demonstrate procedures and types of medicated baths. Proper methods of ectoparasite prevention as well as treatment will be observed by students.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Bathing animals	1	6
2. Methods of handling wet animals	1	4
3. Dipping various animals for removal of ectoparasites or treatment of skin disorders	1	10
4. The reasons and problems of dusting animals	1	6
	4	26

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MODULE OF INSTRUCTION

Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

Code - 01.0101010703-04

OBJECTIVES to be obtained:

The student will be able to:

1. Bath laboratory animals.
2. Handle wet animals and selectively dry them with various electric dryers, when it is advisable.
3. Identify four types of ectoparasites.
4. Identify the three most common types of eczema and identify treatment of them as prescribed by a veterinarian.
5. State the insecticides and chemicals which can be used to remove ectoparasites for the different groups of animals.
6. List and use preventive steps against reinfestation of ectoparasites in animals and lab.
7. Demonstrate the methods of dusting animals and supply logical explanations for using each method.

Code : 01.01010107[illegible]

AGRICULTURAL

Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Bathing animals Objective 1 Bath laboratory animals.	A. Preparation of animal for bath B. Preparation of shampoo C. Preparation of bathing area as to water temperature D. Towels, rubber mats in tub and on drying table E. Types of shampoo: high oil lather, cream - Lambert Kay Company, polypeptides - Gerard-Pellham Co.
Unit 2 - Methods of handling wet animals Objective 2 Handle wet animals and selectively dry them with various electric dryers, when it is advisable.	A. Drying area B. Cages/dryers C. Brushes and combs D. Drying dogs for grooming-electric dryers, [illegible] dryer . Hand held dryer . Floor dryer . Cage dryer
Unit 3 - Dipping various animals for removal of ectoparasites and skin disorders Objective 3 Identify four types of ectoparasites	A. Four types of ectoparasites . Ticks . Fleas . Lice . Mites List and identify and know its life cycle.

01.0101010703-04 - Code

EDUCATION

BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrations using text, charts, catalogs. . Prepare dog by brushing knots and dirt out of hair . Place animal in tub . Test water temperature . Wet dog and apply shampoo . Scrub dog and rinse well so as to leave no soap . Towel dry dog on table with rubber mat B. Supervised practice	A. Observe demonstration B. Prepare a dog for a bath, use various soaps and thoroughly rinse a dog.	A. Teacher evaluation of student ability to fully prepare and bathe a dog to the satisfaction of industry standards.
A. Demonstration. . Using hand held, floor and cage dryers to prepare a dog for grooming . Use of a comb and/or a brush on the hair while drying B. Supervised practice	A. Observe demonstration B. Practice use of the dryers and fully dry a dog for grooming.	A. Handle the various dryers and properly dry a dog to the satisfaction of the instructor.
A. Lecture, charts, dittos, text, bulletins, specimens of ectoparasites. B. Discussion of the tick, flea, lice and mites, and the life cycle of each. C. Guest speaker-veterinarian.	A. Note four types of ectoparasites and know the life cycle and habits of each. B. Identify each type of ectoparasite as they are found on an animal and practice finding these on a number of animals.	A. Oral or written test on student ability to identify and state life cycle of the ectoparasites.

Code - 01.0101010703-04

Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

OBJECTIVES BY UNIT	CONTENT
Objective 4 Identify three most common types of eczema and identify treatment of them as prescribed by a veterinarian	A. Three most common types of eczema . Acute moist type . Itchy dry type . Interdigital type
Objective 5 State the insecticides and chemicals which can be used to remove ectoparasites from the different groups of animals	A. Chemicals used in treating and bathing . Cold blooded animals . Birds . Mammals B. Shampoos used in treating and bathing . Cold blooded animals . Birds . Mammals C. Dusts used in treating and bathing . Cold blooded animals . Birds . Mammals D. Dipping animals . Ticks and mites . Fleas and lice . Skin disorders
Objective 6 List and use preventive steps against reinfestation of ectoparasites in animals and lab	A. Cleaning of lab or shop B. Cleaning of animals--washing and grooming C. Use of chemicals in cleaning and spraying

EDUCATION

01.0101010703-04 - Code

BATHING, DIPPING, DUSTING AND HANDLING OF PET ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/discussion Texts, bulletins, live specimen and movie. B. Demonstrate with live specimens, showing the students three types of eczema and discuss the treatment of each.	A. Student will make notes on the common types of eczema and treatments as the instructor demonstrates B. Practice each phase of the demonstrated operation	A. Test. Identify the type of eczema contracted by an infected dog and give the treatment as recommended by a veterinarian.
A. Supervised study. Demonstrate on the various animals and apply insecticides and shampoos for removal of ectoparasites.	A. Compile notes B. Observe demonstrations C. Laboratory exercises in dipping of the different species of animals for the removal of parasites on treatment of skin disorders. D. Mixing of chemicals	A. The student will be able to dip various animals in the right material for removal of ectoparasites to industry standards.
A. Supervised study B. Demonstration C. Supervised practice using cleaning agents, removal of fleas	A. Compile notes B. Laboratory exercises in cleaning spraying and using chemicals and disinfectants C. Detection of parasites	A. Clean the lab to the satisfaction of the instructor

Code - 01.0101010703-04

Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

OBJECTIVES BY UNIT	CONTENT
Unit 4 - The reasons and problems of dusting animals Objective 7 Demonstrate the methods of dusting animals and supply logical explanations for using each method.	A. Dusting birds for ectoparasites B. Dusting mammals . Methods and reasons . Problems . applying dusts . animal habits . inhalation and ingestion . sensitivity to different species C. Types of dusting powders . Pulvex . Hartz Mountain dusting powder

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration of dusting powders on various animals. B. Discussion on the problems and the types of dusting powders.	A. Laboratory exercises in the dusting of birds and mammals, using the different powders available.	A. Teacher's evaluation of student's ability to use various types of dusting powders.

MODULE OF INSTRUCTION

Title - BATHING, DIPPING, DUSTING AND
HANDLING OF WET ANIMALS

Code - 01. 0101010703-04

RESOURCE MATERIALS

BOOKS

UFAW Handbook
The Care and Management of Laboratory Animals-Published by
E.&S. Livingstone, LTD. London.

The Complete Book of Dog Care-Leon F. Whitney, Doubleday, Garden
City, New York.

BULLETINS

Charles Pomeranty
Vice President - Bell Exterminating Company, New York

MODULE OF INSTRUCTION

Title - STERILIZATION, DISINFECTION AND STERILE PACKS Code - 01.0101010704-01

DESCRIPTION:

The student will learn the different methods of packing and opening of sterile packs usually associated with operations. The methods of packing the different types of cloth packs and labeling of their contents will be taught. The student will learn to identify the use of a sterile pack by the instruments it contains as well as dates of sterilization without having to open the pack. The student will learn the different methods of sterilization with heat, chemicals or radiation and which methods are best used on different types of material and equipment. The student will also learn the different methods for sanitizing and disinfecting the different types of rooms.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Sterilization of Equipment	1	7
2. Sanitizing and Disinfection of Rooms	0	8
3. Preparing Sterile Packs	0	6
4. Opening Sterile Packs	0	4
5. Handling Sterile Equipment	0	4
	1	29

Revised August 1975

MODULE OF INSTRUCTION

Title - STERILIZATION, DISINFECTION AND STERILE PACKS

Code - 01.0101010704-01

OBJECTIVES to be obtained:

The student will be able to:

1. Sterilize equipment using heat or chemical sterilization techniques.
2. Determine the proper methods for sterilizing each type of equipment.
3. Disinfect animal cages, and operating and laboratory rooms.
4. Evaluate the different types of sanitizing procedures and determine the best methods to use when given a specific area to sanitize.
5. Properly pack a sterile pack containing instruments, cloth, and rubber gloves.
6. Label sterile packs as to contents and date of sterilization.
7. Open a sterile pack using aseptic technique.
8. Remove sterile towels, drapes or sheets from a pack without contaminating them.
9. Open pre-packed sterile envelopes and remove the contents using sterile or aseptic techniques.
10. Handle sterile equipment with the use of sterile instruments.

Code - 01.0101010704-01

Title - STERILIZATION, DISINFECTION AND STERILE PACKS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Sterilization of Equipment Objective 1 Sterilize equipment using heat or chemical sterilization techniques	A. Dry heat . Ovens (hot air) . Incineration (destroying materials) B. Moist heat . Boiling . Live steam . free flowing . compressed . types and operation of autoclaves C. Chemical . Liquids . Gases D. Radiation
Objective 2 Determine the proper methods for sterilizing each type of equipment	A. Utensils . Metal . Rubber . Plastic . Glass . Electronic . Thermometers B. Supplies . Wood . Cloth . Chemicals . Paper
Unit 2 - Sanitizing and Disinfection of Rooms Objective 3 Disinfect animal cage, operating and laboratory rooms	A. Steam . Jenny B. Chemical . Gas . Liquids C. Safety precautions to be observed

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study C. Discussion D. Demonstration E. Supervised practice	A. Compile notes B. Participate in discussion C. Observe demonstrations D. Practice demonstrated techniques	A. Teachers evaluation of students ability to sterilize with dry heat, moist heat, chemicals and radiation.
A. Lecture and discussion B. Demonstration on techniques of sterilization C. Supervised practice D. Field trip to a lab setting	A. Compile notes B. Participate in discussion C. Practice demonstrated techniques D. Participate in field trip	A. Teachers evaluation of students ability to sterilize utensils and supplies
A. Supervised study B. Class discussion C. Demonstration of each method D. Field trip to lab during disinfecting period E. Supervised practice	A. Compile notes B. List rules for use of each type of disinfecting system C. Participate in class discussion D. Observe demonstration E. Practice demonstrated techniques F. Prepare a list of safety precautions to be observed when using disinfecting techniques	A. Oral or written test outlining procedures for use of each disinfecting system and listing safety precautions to be observed. B. Teachers evaluation of students ability to use disinfecting equipment and materials.

Code - 01.0101010704-01

Title - STERILIZATION, DISINFECTION AND STERILE PACKS

OBJECTIVES BY UNIT	CONTENT
Objective 4 Evaluate the different types of sanitizing procedures and determine the best methods to use when given a specific area to sanitize	A. Evaluation . Types of walls, ceilings, floors . Types and numbers of windows, electrical outlets and the exhaust system B. Application . Ceiling-including fixtures . Walls-including switches, windows, thermostats . Floors-including drains
Unit 3 - Preparing Sterile Packs Objective 5 Properly pack a sterile pack containing instruments and one containing cloth	A. Folding cloth pack covers . Instrument trays . Gloves . Towels and covers
Objective 6 Label sterile packs as to contents and date of sterilization	A. Types of markers . Use of each B. Position and size of label
Unit 4 - Opening Sterile Packs Objective 7 Open a sterile pack using aseptic techniques	A. Unfolding top cover B. Unfolding under cover C. Removal of equipment from pack

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/discussion B. Class discussion C. Supervised study	A. Compile notes . List items to be considered in rooms B. Sanitize a room and its contents	A. Teachers evaluation of students lists of items. B. Oral or written test on evaluation and application procedures
A. Class discussion B. Demonstration C. Supervised practice	A. Participate in discussion B. Observe demonstration C. Practice demonstrated procedures	A. Teachers evaluation of students packing skill
A. Demonstration B. Supervised practice	A. Observe demonstration B. Practice demonstrated technique	A. Teachers evaluation of students ability to label a pack
A. Class discussion B. Demonstration C. Supervised practice	A. Participate in class discussion B. Observe demonstrations C. Practice demonstrated techniques	A. Teachers evaluation of students ability to aseptically open a sterile pack

Code - 01.0101010704-01

Title - STERILIZATION, DISINFECTION AND STERILE PACKS

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Handling Sterile Equipment Objective 8 Remove sterile towels, drapes or sheets from a pack aseptically	A. Handling . Towels . Drapes . Sheets . Other cloth
Objective 9 Open prepared sterile envelopes and remove the contents using aseptic techniques	A. Items included . Needles . Syringes . Sutures . Tubing
Objective 10 Handle sterile equipment with the use of sterile instruments	A. Instruments . Forceps B. Techniques

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration B. Supervised practice	A. Observe demonstration B. Practice demonstrated technique	A. Teachers evaluation of students skill in aseptically removing towels, drapes and sheets from a pack
A. Demonstration B. Supervised practice	A. Observe demonstration B. Practice demonstrated techniques	A. Teachers evaluation of students ability to aseptically remove contents of prepacked sterile envelopes
A. Demonstration B. Supervised practice	A. Observe demonstration B. Practice demonstrated techniques	A. Teachers evaluation of students ability to handle sterile equipment with sterile instruments

RESOURCE MATERIALS

A. **Books** -

Sterilization and Disinfection with Special Emphasis on Autoclave Sterilization
J.S. Beckett & P. Berman
A.T.I. Publication Division
North Hollywood, Calif.

Antiseptics, Disinfectants, Fungicides and Disinfection
G. F. Reddish et al;
Lea & Febiger
Philadelphia, Penn.

B. **Bulletins** -

RESOURCE MATERIALS (cont'd)

C. Periodicals -

D. Audiovisuals -

The Unsterile Field
Davis and Geck, Division of American Cyanamid Co
Danbury, Conn.

The Use of Surgical Instruments
Davis and Geck, Division of American Cyanamid Co.
Danbury, Conn.

Fundamental Aseptic Technics
Davis and Geck, Division of American Cyanamid Co.
Danbury Conn.

Sterilization Procedures for the Medical Office
Wyeth Film Library
Philadelphia, Pa

Chemical Disinfection
Fundamentals of Detergents
Available from: National Medical Audiovisual Center
Chamblee, Georgia

MODULE OF INSTRUCTION

Title - ASSISTING IN SURGICAL PROCEDURES

Code - 01.01010704-02

DESCRIPTION:

The students will learn to assist the surgeon in the operating room from the preparation of the room for surgery through the cleaning of the instruments following the operation. This assistance will include the preparation of the surgical trays, the animals including the shaving and cleaning of the surgical area as well as the postoperative care of the animals. The students will learn to put on surgical caps, gowns and gloves without contamination. They will also learn techniques of passing instruments to the surgeon and assisting in the procedures by holding instruments, cutting sutures and cleaning the incisions. The students will also learn to give postoperative care such as taking the animal's temperature and respiration as well as giving them medications.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Other
1. Preparing the operating room	2	4
2. Assisting the surgeon	0	8
3. Bandaging animals	0	6
4. Cleaning the operating room and equipment	0	8
5. Postoperative care of animals	0	2
	2	28

Revised August 1975

MODULE OF INSTRUCTION

Title - ASSISTING IN SURGICAL PROCEDURES

Code - 01.01010704-02

OBJECTIVES to be obtained:

The student will be able to:

1. Prepare an operating room for operations, and scrub properly for surgery.
2. Put on surgical caps and gowns using aseptic techniques.
3. **Set up** the surgical instruments on trays and prepare sutures and other packets within the surgical trays.
4. Prepare the surgical area of the animal for the operation.
5. Aseptically handle the instruments and pass them to the surgeon as needed.
6. Assist the surgeon by cutting sutures and cleaning the incisions.
7. Bandage the incisions of animals following surgery.
8. Clean the surgical instruments and surgical area after surgery.
9. Make the animal comfortable after surgery.
10. Take and record the animal's temperature, pulse and respiration at regular intervals.
11. Administer medications to animals orally, intermuscularly, subcutaneously, and rectally.

Code - 01.01010704-02

Title - ASSISTING IN SURGICAL PROCEDURES

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Preparing the operating room Objective 1 Prepare an operating room for operations, and scrub properly for surgery.	A. Preparing the table . Instrument tray B. Adjusting the lights C. Variations for different operations
Objective 2 Put on surgical caps and gowns using aseptic techniques	A. Preparing oneself after scrubbing . Cap . Gown . Gloves B. Assisting others in preparing . Cap . Gown . Gloves
Objective 3 Set up the surgical instruments on trays and prepare sutures and other packets within the surgical trays.	A. Preparation of instruments . Opening packs . Preparation of sutures and other sealed units B. Preparation of other operating room equipment . Medication . Gases
Unit 2 - Assisting the surgeon Objective Prepare the surgical areas of the animal for the operation.	A. Shaving B. Washing skin . Surgical soap C. Marking surgical area

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Class discussion C. Supervised practice	A. Compile notes B. Participate in class discussions C. Practice procedure outlined in lecture	A. Teacher's evaluation of student's ability to prepare the operating room.
A. Class discussion B. Demonstration C. Supervised practice	A. Participate in discussion B. Observe teacher demonstrations C. Practice demonstrated procedures	A. Teacher's evaluation of student's ability to put on surgical cap and gown.
A. Lecture B. Class discussion C. Demonstrations D. Supervised practice E. Field trip to clinic to observe the operating room being arranged	A. Compile notes B. Participate in discussion C. Observe demonstrations D. Practice demonstrated techniques E. Participate in the field trip	A. Teacher's evaluation of student's ability to prepare instruments, trays, sutures and packets for surgery
A. Class discussion B. Demonstration C. Supervised practices	A. Participate in class discussion. B. Observe demonstrations C. Practice demonstrated techniques	A. Teacher's evaluation of student's ability to shave and wash an animal for surgery.

OBJECTIVES BY UNIT	CONTENT
Objective 5 Aseptically handle the instruments and pass them to the surgeon as needed.	A. Method of grasping instruments B. Circulation in the operating room C. Passing instruments
Objective 6 Assist the surgeon by cutting sutures and cleaning the incisions.	A. Instruments to be used 3. Cutting procedures
Unit 3 - Bandaging Animals Objective 7 Bandage the incisions of animals following surgery	A. Bandaging to appendages B. Bandaging the head C. Bandaging the body D. Use of shields to protect wounds
Unit 4 - Cleaning the operating room and equipment Objective 8 Clean the surgical instruments and surgical area after surgery	A. Instruments and gauge . Count . Clean B. Cleaning the operating room

E D U C A T I O N

01.01010704-02 - Code

ASSISTING IN SURGICAL PROCEDURES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/demonstration B. Demonstrations C. Supervised practice	A. Participate in discussion B. Observe demonstrations C. Practice demonstrated techniques D. Apply for a job in this area	A. Teacher's evaluation of student's procedure of handling instruments.
A. Field trip to clinic to observe operating procedure and demonstrations B. Supervised practice	A. Participate in field trip B. Practice demonstrated techniques	A. Teacher's evaluation of student's skill in cutting sutures and cleaning incisions.
A. Demonstrations B. Supervised practice	A. Observe demonstrations B. Practice applying bandages	A. Teacher's evaluation of student's ability to apply bandages
A. Class discussion B. Field trip to operating room to observe	A. Participate in class discussion B. Participate in field trip C. Take notes D. List procedures to be followed in cleaning the operating room	A. Teacher's evaluation of student's notes B. Oral or written test on cleaning procedures of operating room.

Code - 01.01010704-02

Title - ASSISTING IN SURGICAL PROCEDURES

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Postoperative care of animals Objective 9 Make the animal comfortable after surgery	A. Position of animal B. Room temperature C. Observation
Objective 10 Take and record the animal's temperature, pulse, and respiration at regular intervals.	A. Use of thermometer B. Frequency C. Record temperature
Objective 11 Administer medications to animals orally, intermuscularly, subcutaneously, and rectally.	A. Oral B. Injectables C. Rectal D. Subcutaneously E. Interveneous

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Guest speaker-veterinarian B. Supervised study	A. Prepare material or post-operative practices to comfort animal B. Observe actual postoperative care	A. Teacher's evaluation of student's prepared material
A. Lecture/discussion B. Demonstration C. Supervised practice	A. Participate in discussions B. Observe demonstrations C. Practice demonstrated procedure	A. Teacher evaluation of student's ability to take temperature, read thermometer and record information
A. Lecture/discussion B. Demonstrations C. Supervised practices	A. Participate in discussion B. Observe demonstrations C. Practice administering medication	A. Teacher's evaluation of student's procedure in administering medication.

RESOURCE MATERIALS

A. **Books** -

Edythe Alexander
Operating Room Techniques
C.V. Mosby Co
St. Louis, Mo.

B. **Bulletins** -

RESOURCE MATERIALS (cont'd)

C. Periodicals -

Preoperative and post-operative care of the laboratory dog
Norman Bleicher
Proc. anim Care Panel, 10, 5-24 1960

Laborarartory Animal Care
American Association of Laboratory Animal Science
Box 10, Joliet, Ill.

D. Audiovisuals -

Films

1; Laboratory Dogs
2; Basic Dog Surgery

The above two films are supplied by
National Medical Audiovisual Center
Chamblee Georgia

1; The care and handling of surgical instruments
2;Disinfection of the skin
3; Fundamental aseptic technics
4; gowning and gloving for surgery
5; The use of surgical instruments
6; The unsterile field - an O.R. challenge

The above films are supplied by Davis and Geck
Division of American Cyanamid Co
Film Library, Danbury, Conn.

MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis

Code - 01.0101010704-04

DESCRIPTION:

The student will learn to do a complete urine analysis, consisting of tests for albumin, sugar, acetone, ketones, bile and other chemicals. In addition, microscopic examinations should include the identification of red and white blood cells, the different types of casts and tissue cells as well as the identification of the common crystals found in urine specimens. The student will also learn to count both the red and white blood cells in blood samples to determine the hemoglobin concentration in the sample. The student will learn to make and stain blood smears and identify the different types of blood cells found in the smears. The student will also learn to do sedmimentation rates and hematocrits, as well as, bleeding and coagulation times.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Urinalysis	1	9
2. Blood Cell Counting	0	10
3. Hemoglobins	0	2
4. Hematocrit and Sedimentation Rates	0	3
5. Reticulocyte and Platelet Counts	0	3
6. Bleeding and Coagulation Procedure	0	2
	1	29

Revised August 1975

MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis

Code - 01.0101010704-04

OBJECTIVES to be obtained:

The student will be able to:

1. Determine the presence of albumin in urine.
2. Determine the presence of sugar, acetone, ketones, bile, and other chemicals in urine.
3. Use a microscope to identify red and white blood cells in urine samples.
4. Identify casts and tissue cells in urine samples.
5. Recognize and identify the common crystals found in urine samples.
6. Count red and white blood cells in blood samples.
7. Make and stain blood smears, and determine the different types of white blood cells seen on a blood smear.
8. Determine the hemoglobin of a blood sample.
9. Determine the sedimentation rate and volume of packed cells of a given blood sample.
10. Recognize both reticulocytes and platelets on a blood smear.
11. Determine the bleeding and coagulation times.
12. Recognize abnormal or infected blood cells seen on blood smears.

Code - 01.0101010704-04

Title - **Hematology and Urine Analysis**

OBJECTIVES BY UNIT	**CONTENT**
Unit 1 - Urinalysis	
Objective 1 Determine the presence of albumin in urine.	A. Chemical analysis . Protein . blood . albumin B. Indications of analysis
Objective 2 Determine the presence of sugar, acetone, or ketones, bile, and other chemicals in urine.	A. Glucose and other sugars B. Acetone and other ketones C. Bile
Objective 3 Use a microscope to identify red and white blood cells in urine samples.	A. Slides B. Cover slips C. Microscope . Powers . Focus . course . fine D. Properties of red blood cell E. Properties of white blood cell
Objective 4 Identify casts, and tissue cells in urine samples.	A. Casts . Color B. Tissue

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study C. Demonstrate examples of each article	A. Compile notes B. Recognize each article of protective wear	A. Oral or written test or identification of each article of protective wear and its use.
A. Lecture B. Discussion C. Supervised study	A. Compile notes B. Draw pictures of machine label parts. C. Participate in class discussion.	A. Oral or written test on identification of machine parts.
A. Lecture/discussion	A. Compile notes	A. Oral or written test listing the steps to be used in operating the machines. B. List basic principles of use of X-ray machine.
A. Lecture/discussion B. Field trip to animal clinic to observe procedures. C. Prepare mimeo	A. Compile notes B. Cut and paste pictures of positions from magazines. C. Participate in field trip	A. Oral or written test on position for each type X-ray.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - X-Ray Film Care and Developing Objectives 5 Load X-ray film into its plate, label the films prior to taking the pictures and place the plates in proper position for taking the pictures.	A. Loading plates B. Labeling films C. Positioning film plates
Objective 6 Mix chemical developer and fixer used in the darkroom in preparing X-ray films.	A. Chemicals . Developer . Fixer . Solutions B. Dryers C. Safety
Objective 7 Develop and dry the X-ray films.	A. Film preparation B. Mixing chemicals C. Use of dryer D. Developed product

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/discussion B. Field trip to Radiology Lab. C. Demonstration D. Supervised practice	A. Participate in discussion B. Observe demonstration C. Practice demonstrated techniques. D. Become familiar with use and care of film.	A. Oral or written test, listing the materials required for the process, and preparing a step by step procedure for loading, labeling and positioning plates.
A. Class discussion B. Demonstration C. Supervised practice	A. Participate in class discussion. B. Observe demonstration C. Practice demonstrated techniques.	A. Teacher's evaluation of student's ability to use chemical and dryers properly, safely, and economically.
A. Demonstration B. Supervised practice	A. Observe demonstration B. Practice techniques demonstrated.	A. Teacher's evaluation of student's ability to develop and dry X-ray films.

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Radiological Techniques Objective 8 Monitor radioactive materials in animal laboratory use.	A. The atom and isotopes . Radioactivity . dangers . self . animals . monitoring . half-life
Objective 9 Safely handle animals which have been treated with radioactive materials.	A. Animals treated with isotopes and other radioactive material . Washing cages . Care of animals . Time period
Objective 10 Dispose of waste materials and clean cages of animals treated with radioactive materials.	A. Animal excretory wastes B. Deceased animals

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/discussion B. Supervised study	A. Prepare notes on radioactive materials. B. Participate in class discussion.	A. Oral or written test on monitoring radioactive material in the animal laboratory.
A. Lecture/discussion B. Supervised study	A. Prepare notes B. Participate in class discussion.	A. Teacher's evaluation of notes compiled.
A. Guest speaker - Radiological technician or veterinarian	A. Compile notes and participate in discussion. B. Prepare a list of methods to dispose of animal waste materials.	A. Oral or written test on disposal of waste exposed to radioactive material.

MODULE OF INSTRUCTION

Title - Radiological Techniques Code - 01.0101010704-03

RESOURCE MATERIALS

Books:

U.S. Army Manual of X-Ray Procedures
U.S. Government Printing Office
Washington, D. C.

The I.A.T. Manual of Laboratory Animal Practice & Techniques
D.J. Short & Dorothy P. Woodnott
Charles C. Thomas
Springfield, Illinois

Films:

1. Fundamentals of Radioactivity (Part 1)
2. Properties of Radiation
3. Practical Procedures of Measurement
4. The Physical Principles of Radiological Safety

The above four films may be obtained from

Commanding General

First U.S. Army Area

New York, New York

MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis | Code - 01.0101010704-04

DESCRIPTION:

The student will learn to do a complete urine analysis, consisting of tests for albumin, sugar, acetone, ketones, bile and other chemicals. In addition, microscopic examinations should include the identification of red and white blood cells, the different types of casts and tissue cells as well as the identification of the common crystals found in urine specimens. The student will also learn to count both the red and white blood cells in blood samples to determine the hemoglobin concentration in the sample. The student will learn to make and stain blood smears and identify the different types of blood cells found in the smears. The student will also learn to do sedmimentation rates and hematocrits, as well as, bleeding and coagulation times.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Urinalysis	1	9
2. Blood Cell Counting	0	10
3. Hemoglobins	0	2
4. Hematocrit and Sedimentation Rates	0	3
5. Reticulocyte and Platelet Counts	0	3
6. Bleeding and Coagulation Procedure	0	2
	1	29

Revised August 1975

MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis

Code - 01.0101010704-04

OBJECTIVES to be obtained:

The student will be able to:

1. Determine the presence of albumin in urine.
2. Determine the presence of sugar, acetone, ketones, bile, and other chemicals in urine.
3. Use a microscope to identify red and white blood cells in urine samples.
4. Identify casts and tissue cells in urine samples.
5. Recognize and identify the common crystals found in urine samples.
6. Count red and white blood cells in blood samples.
7. Make and stain blood smears, and determine the different types of white blood cells seen on a blood smear.
8. Determine the hemoglobin of a blood sample.
9. Determine the sedimentation rate and volume of packed cells of a given blood sample.
10. Recognize both reticulocytes and platelets on a blood smear.
11. Determine the bleeding and coagulation times.
12. Recognize abnormal or infected blood cells seen on blood smears.

Code - 01.0101010704-04

Title - **Hematology and Urine Analysis**

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Urinalysis	
Objective 1 Determine the presence of albumin in urine.	A. Chemical analysis . Protein . blood . albumin B. Indications of analysis
Objective 2 Determine the presence of sugar, acetone, or ketones, bile, and other chemicals in urine.	A. Glucose and other sugars B. Acetone and other ketones C. Bile
Objective 3 Use a microscope to identify red and white blood cells in urine samples.	A. Slides B. Cover slips C. Microscope . Powers . Focus . course . fine D. Properties of red blood cell E. Properties of white blood cell
Objective 4 Identify casts, and tissue cells in urine samples.	A. Casts . Color B. Tissue

EDUCATION

01.0101010704-04 Code

Hematology and Urine Analysis - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Demonstration C. Supervised practice	A. Compile notes B. Observe demonstration C. Practice techniques demonstrated.	A. Teacher's evaluation of student's ability to determine the presence of albumin in urine.
A. Lab demonstration B. Supervised practice	A. Observe demonstration B. Practice identifying sugar, acetone and bile, in urine during a lab exercise.	A. Teacher's evaluation of student's ability during lab exercise.
A. Demonstration B. Supervised study C. Supervised practice	A. Observe demonstration and practice using the microscope. B. Prepare notes on properties of blood C. Practice using the identification of blood cells using a microscope.	A. Teacher's evaluation of student's ability to identify both red and white blood cells.
A. Lecture - discussion B. Teacher demonstration C. Supervised practice D. Lab exercise	A. Participate in class activity B. Observe demonstration C. Practice identifying	A. Teacher evaluation of student's ability to identify casts, and tissue cells.

Code - 01.0101010704-04

Title - Hematology and Urine Analysis

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Blood Cell Counting Objective 6 Count red and white blood cells in blood samples.	A. Collection of blood B. Diluting blood C. Filling counting chambers D. Automatic electronic counters E. Red blood count F. White blood count
Unit 3 - Hemoglobins Objective 7 Make blood stain smears and determine different types of white blood cells on the smear.	A. Leukocyte smears . Making blood smears . Types of white blood cells . Differential white blood cells count . Platelets
Objective 8 Determine the hemoglobin content of a blood sample.	A. Salhi and Haden Houser methods B. Cyanmethemoglobin methods
Unit 4 - Hematocrit and Sedimentation Rates Objective 9 Determine the sedimentation rate and volume of packed cells of a given blood sample.	A. Sedimentation rate of samples B. Volume of packed blood cells . Micro technique . Macro technique

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Laboratory exercise	A. Participate in lab exercise	A. Teacher's evaluation of student's ability to recognize and count blood cells.
A. Laboratory exercise	A. Prepare smears B. Observe smears for abnormalities. . Infected cells . Abnormal cells	A. Teacher's evaluation of student's lab procedure and ability to make smears.
A. Laboratory exercise	A. Determine the amount of hemoglobin in a sample using different methods.	A. Teacher's evaluation of student's lab procedure.
A. Demonstration B. Laboratory exercise	A. Observe demonstration B. Complete lab and use both techniques.	A. Teacher's evaluation of student's procedure.

Code - 01.0101010704-04

Title - Hematology and Urine Analysis

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Reticulocyte and Platelet Counts Objective 10 - Recognize both reticulocyte and platelets on a blood smear.	A. Blood smear . Reticulocyte counts . Platelet counts
Unit 6 - Bleeding and Coagulation Precedure Objective 11 - Determine the bleeding and coagulation times.	A. Bleeding time B. Coagulation time
Objective 12 Recognize abnormal or infected blood cells seen on blood smears.	A. Abnormalties B. Identification of infection

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration B. Laboaratory exercise	A. Complete lab exercise using demonstrated techniques.	A. Teacher's evaluation of student's lab procedure.
A. Supervised study B. Demonstration C. Laboratory exercise	A. Compile notes B. Observe demonstration C. Complete lab exercise	A. Teacher's evaluation of student's lab procedure.
A. Laboratory exercise B. Class discussion	A. Participate in laboratory exercise. B. Participate in class discussion.	A. Teacher's evaluation of lab procedure.

MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis Code - 01.0101010704-04

RESOURCE MATERIALS

Books:

Laboratory Procedures in Clinical Hematology
Department of the Army Technical Manual
U.S. Government Printing Office
Washington, D. C.

Laboratory Procedures in Urinalysis
Department of the Army Technical Manual
U. S. Government Printing Office
Washington, D. C.

Approved Laboratory Technique
Kolmer J.A., Spaulding E.H., & H.W. Robinson
Appleton-Century-Crofts, Inc.
New York, New York

Audiovisuals:

The Blood
Encyclopedia Britannica Educational Corp.
Chicago, Illinois

1. White Blood Cells
2. Excretion
   McGraw-Hill Book Co.
   New York, New York

E D U C A T I O N

01.01010699-03 - Code

- Title

RAISING DAIRY BEEF

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture	A. Note taking	A. Test written or oral on reason for specific selections, feeding and housing of dairy beef.
B. Supervised study in collective birth and mature weights for each breed.	B. Selected members of the class will chart and prepare a bulletin board display of pictures of animals, their birth, and mature weights.	B. Note book grade
C. Field trip to farms raising dairy beef.		C. Student project grade.
D. Supervised problem solving as to which animals and feeding programs for a project.		
. Agway Dairy Beef Program . Economics of Tend-R-Leen . Newspapers . Local markets . Local farmers . records . Successful Farming 1/72 Vol. 70, No. 1 . Successful Farming 2/72, Vol. 70, No. 2 . Hoards Dairymen 2/10/72 Vol. 117, No.3 . Hoards Dairymen 3/10/72 Vol. 117, No. 5 . Agway Cooperator Jan.-Feb. '68	A. Students must select the breed or breeds to use for a dairy beef project. B. Students indicate the feeding program and system.	

Code - 01.01010699-03

Title - RAISING DAIRY BEEF

OBJECTIVES BY UNIT	CONTENT
Objective 2 Outline a feeding program to the instructor's satisfaction which can be used in raising calves, from birth to 6 weeks.	A. Feed Program . Colostrum - Free access at birth, possibly for (Essential) 2 days of life . Milk replacer - Tend-R-Leen Formula as advised by Mfg. . Calf grower - Tend-R-Leen Formula - free choice . Water - Free access . Bedding - Inedible product
Objective 3 List seven requirements to consider when preparing a housing facility for growing Diary Beef Calves from birth to 6 weeks.	A. Special needs . 5 sq. ft./100 lbs. of weight B. Shelter . Draft free) Warm 40° - 50° . Dry) (winter) C. Accessibility for cleaning . Not extremely important for calf pens . Easily disenfected every 6 weeks D. Temperature regulation . Electricity - Heat lamps for winter . Exhaust fans E. Handling facilities . Chute for restricting . Dehorning . Medicinal purposes

EDUCATION

01.01010699-03 - Code

RAISING DAIRY BEEF - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Review programs in area C. Class discussion	A. Outline calf feeding program B. Define the amounts to be fed of each item C. Students report if they have animal units in their supervised work experience programs	A. Test on feeding programs. Essay questions
A. Supervised study B. Field trip to farm raising calves C. Slides or film indicating types of housing facilities	A. Break class into two groups- . Research and record the needs of housing tenderleen calves . Research and record the needs of housing for dairy or other beef calves . Discuss and compare results	A. Oral or written test on requirements of housing facilities for growing dairy beef calves. B. Grade on student discussion sessions.

Code - 01.01010699-03

Title - RAISING DAIRY BEEF

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Health Programs Objective #4 Identify the causes, symptoms, and controls of calf diseases.	A. Causes of diseases . Stress factors . Low resistance . Exposure to infectious disease organisms . Wet drafty, contaminated quarters .pneumonia .leptospirosis .influenza .hemoragic septicemia .tuberculosis .navel infection B. Disease symptoms . Off feed . Nasal discharges . Abnormal feces . Coughing . Listlessness . Bloody discharge in urine and feces . Abnormal temperatures C. Disease controls . Vaccinations . Nutrition . Antibiotics . Management D. Parasites - Symptoms and controls . Round worms . Tape worms . Others

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Guest speaker C. Slides on common diseases D. Assign two students to each disease. Research and oral report on the specific disease	A. Research and record information to be used in a program for maintaining health in Dairy Beef B. Notes on students C. Class discussion on each other students record information in report	A. Written report on causes, symptons, and control of diseases. B. Notebook evaluation C. Evaluation of students oral reports

Code - 01.01010699-03

Title - RAISING DAIRY BEEF

OBJECTIVES BY UNIT	CONTENT
Objective 5 Demonstrate the ability to detect diseases involving at least 3 symptoms each for the two stress diseases	A. Scours . Symptoms B. Pneumonia . Symptoms
Objective 6 Demonstrate the ability to administer injections, use a balling gun, take and record temperature readings	A. Hypodermic injection B. Administering pills and capsules using balling gun C. Temperature
Objective 7 Outline to the instructor's satisfaction a health program which could be implemented for Dairy Beef calves for the period from birth to 6 weeks of age.	A. Recommended dairy beef calf health program . Immunizations . Antibiotics B. Disease prevention methods . feeding . management

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trip to a calf project B. Supervised study C. Class discussion	A. Practice detecting diseases and malfunctions in calves on the home farm, cooperative farm or animals used in supervised work experience programs.	A. Instructor's evaluation . Oral . Written
A. Field trip to calf project B. Demonstration C. Supervised study	A. Discuss each procedure B. Apply knowledge to animal units used in supervised work experience projects.	A. Instructor's evaluation **and performance** grade
A. Supervised study B. Class discussion C. Veterinarian invited to class to discuss health problems.	A. Let each student use information previously acquired to outline a health program to be followed in raising Dairy Beef Calves	A. Instructor's evaluation of students health program

OBJECTIVES BY UNIT	CONTENT
Objective 8 Demonstrate the ability to castrate dehorn, and trim hooves on young animals.	A. Castration . Elastration . Bridizzo . Scalpal or knife B. Hoof trimming . Snippers . Chisel C. Dehorning . Electric . Caustic pencil . Gauge
Objective 9 Identify at least ten diseases and their symptons, common to dairy beef animals from 6 weeks of age to finish.	A. Present value of animal including labor and feed. B. Specific diseases of concern . Shipping fever . Foot rot . Pneumonia . Warts . Pinkeye . Ringworm . Hardware . Tuberculosis . Tetanus . Eye cancer . Deficiencies . Bloat/feed-lot . Poisons

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trip to calf raising operation	A. Perform demonstrated skills of each operation on calves	A. Instructor's evaluation of students performance on animals
B. Demonstration of each operation and discussion	B. Discuss the problems which occur in actual operation	B. Oral or written test on content
	C. Keep notes on field trips, demonstrations and class discussion.	
A. Supervised study	A. Prepare a report on the disease assigned by each Report thoroughly using mimeo handouts, blackboard, film strips or slides.	A. Evaluation of reports and notebook work.
B. Assign each student to prepare causes symptoms and control - report on one disease.	B. Take notes on reports, recording causes, symptoms, and controls, of each disease.	
C. Discussion		

AGRICULTURAL

Module RAISING DAIRY BEEF 01.01010699-03

OBJECTIVES BY UNIT	CONTENT

Unit 3 - Growing the Animals

Objective 10

Outline a feeding program for Dairy Beef from age 6 weeks to finish.

A. Animals should weigh approximately 200 lbs at 6 weeks

- 200-400 lbs — Feed/animal

Tenderleen Grower Conc.	
Whole Shell corn, or high moist.	1 1/2-2 lbs/da.
Water	Free choice
Mineral mix-ADF	Free choice
Salt and ground limestone	Free choice

- 400-600 lbs.

Tend-R-Leen Steer Finisher Concentrate	1 1/2-lb/da
Whole shelled or high moist. con.	Free choice
Water	Free choice
Mineral mix-ADF	Free choice
Salt and ground limestone	Free choice

- 600 lbs — Finish

Tend-R-Leen Steer Finisher Conc.	1 1/2 lb/da.
Whole shelled or high moist. con.	Free choice
Water, mineral mix ADF	Free choice
Salt and ground limestone	Free choice

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Review records of Dairy Beef Programs in the community	A. Students select a program that would work in a given farm situation. Give reasons and justification for the selected program.	A. Oral quiz on feeding program selected by students.

OBJECTIVES BY UNIT	CONTENT
Objective 11 Select 10 requirements of housing, and lot facilities required for growing Dairy Beef steers 6 weeks to finish.	A. Special requirements 5-10 sq. ft./100 lbs. of animal (on paved lots) 150-500 sq. ft./head (on unpaved lots) B. Shelter - . 3-sided structure . Draft free . Not susceptiable to wind or elements . Accessible for mechanical cleaning . Dry C. Watering . Automatic D. Handling facilities . Restricting chute . Scales or tape animals . Loading ramp F. Fencing . Wood . Metal
Unit 4 - Finish and Marketing Objective 12 Name the proper feeding techniques to be used in finishing Dairy Beef.	A. Underfinishing . Animals which should have been culled . Insufficient feeding conditions . Lack of water B. Overfinishing . Overfeeding . Early finish lower quality C. Economy . Total cost of raising animals . Cost per day of raising animals . Profit margin over feed cost

EDUCATION

01.01010699-03 - Code

RAISING DAIRY BEEF - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Field trip to established operation to observe the structures essential for handling Dairy Beef	A. Research and record requirements of housing, lots, and facilities for Dairy Beef B. Calculate special requirements. C. Construct a model of a recommended facility for 50 head of livestock (pole barn and fence)	A. Written test B. 3-special requirement problems constructed by the instructor. C. Evaluate model plans.
A. Class lecture and discussion. B. Guest speakers . Feeder . Livestock marketer . Farmer	A. Record notes on class lecture and discussion and speakers. B. Select students to plot a growth curve for . Underfinished animals vs. Economy . Overfinished animals vs. Economy	A. Oral or written test on objective material.

Code - 01.01010699-03

Title - RAISING DAIRY BEEF

OBJECTIVES BY UNIT	CONTENT
Objective 13 Locate 5 facilities available for marketing Dairy Beef	A. Market Outlets . Friends and relatives . Locate slaughter and retail facilities . Chain stores . Livestock markets . Dealers B. Prices . Supply . Demand

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Problem solving discussion of actual cases.	A. Students can contact available prospective buyers of the finished product and report findings to class.	A. Instructor's evaluation of students reports.
B. Let each student locate 2 available facilities used to market Dairy Beef. Report on the advantages and disadvantages of each facility.	B. Make note of projected values.	

MODULE OF INSTRUCTION

Title - RAISING DAIRY BEEF

Code - 01.01010699-03

RESOURCE MATERIALS

A. Books - Beef Cattle, Neumann & Snapp, 6th edition, J. Wiley & Sons
Animal Science, Ensminger, Interstate
Cattleman's Handbook , Interstate
Animal Sanitation & Disease Control, Interstate

B. Bulletins -

1. Economics of Tend-R-Leen, Doby Feeds, New Richmond, Wisc.
2. Tend-R-Leen Beef Feeding Program, Beacon Feeds
3. Agway Beef Feeding Program, Agway Coop.
4. Bulletins from other feed companies

C. Periodicals -

Hoards Dairyman
Successful Farming
Agway Cooperator
Beacon News
Farm Journal
Cattleman's Journal

MODULE OF INSTRUCTION

Title - PLANNING THE CROPPING PROGRAM

Code - 01.01020103-01

DESCRIPTION:

The plan for a cropping program depends on the type of farm enterprises, geographic location, alternative markets, and varieties of crops available. Students will develop skills in planning a suitable cropping program that will provide adequate feed for a particular enterprise.

Analysis of the characteristics of the land, micro-climate, feed requirements or markets of several farms will be conducted in order to determine crop programs best suited to such enterprises or markets.

DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Cropping Considerations	4	5
2. Determining the Soil Productivity	2	4
3. Selecting the Crops and Varieties	4	2
4. Crop Inputs	2	1
5. Determining the Crop Requirements for a Specific Enterprise or Market	6	0
	18	12

Revised January '75

MODULE OF INSTRUCTION

Title - PLANNING THE CROPPING PROGRAM Code - 01.01020103-01

OBJECTIVES to be obtained:

The student will be able to:

1. Determine the climatic factors that influence a cropping program.
2. Determine the influence of soils on the cropping program.
3. Determine the cropping program as it may be influenced by governmental agencies.
4. Determine the cropping program on the basis of the physical farm situation.
5. Determine the needs for forage and grains by various classes of livestock.
6. Determine the benefit of rotation vs. mono cropping system.
7. Determine the yield of crops on a farm under various situations of management and soil condition.
8. Select crop species and varieties suitable for a cropping program of a given farm on the basis of climate, soil and physical situation.
9. Determine inputs that are required for the production of a crop and the possible anticipated returns.
10. Prepare a comprehensive plan for a farm cropping program.

Code - 01.01020103-01

Title - PLANNING THE CROPPING PROGRAM

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Cropping Considerations Objective #1 Determine the climate factors that influence a cropping program.	A. Climate Factors affecting crop production . Rainfall and moisture . monthly and seasonal . amount at a given time . number of days having 01. inch rain a month . Temperatures . variations within month . patterns . Growing season . frost dates . season . growth degrees . Dry length factors . Sunshine - and cloud cover . Wind speed and direction . Micro climatic conditions . frost . rainfall . topographic influence
Objective #2 Determine the influence of soils on the cropping program.	A. Soil conditions to be considered . Texture . Structure . Tilth . Slope . Erosion . Drainage class . Ease of cultivation . Fertility level
Objective #3 Determine the cropping program as it may be influenced by governmental agencies.	A. Governmental programs available . Acreage controls . wheat . corn . soybean . Conservation practices . pasture renovation . lime program . Applications for varied programs . preparation of farms

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - Discussion of weather through the year and growing season using weather data from "What's Cropping Up" - Weather, crop reporting service data, and local weather station data. B. Student preparation of rainfall graphs for area for growing season. Calculation of Growing Degree Days available for field crops. Determination of critical photo period dates, planting periods for specific crops. C. Tape recordings of daily weather forecasts for local area, particular emphasis of the agricultural forecast including long range forecast. D. Lecture - Discussion and group study of climatic requirements for plant growth.	A. Preparation of charts and graphs of climatic factors. . Operation of weather instruments at school and compare observations with those of local weather stations. B. Calculation of Daily Heat Degree Days and amount of growing season information. C. Preparation of list of crops that can be successfully grown based on climatic information for your area.	A. Written exam on target dates for planting crops and estimate harvest patterns based on weather and climatic conditions.
A. Lecture and discussion on land use capabilities classifications for fields. B. Study SCS farm plan maps and country soils maps. C. Discuss the kinds of plants that can be grown under different types of soil conditions.	A. Preparation of list of crops that can be successfully grown based on soil conditions. List these in notebooks.	A. Written test on soil conditions and how the conditions influence a cropping program.
A. Guest speaker on field trip to local ASCS office for official to explain the various programs that are currently available for farmers to consider. B. Class discussion of governmental programs	A. Note taking based on discussion with ASCS official and preparation of written report of the suitability of following some governmental programs in the cropping system.	A. Written report of visit or field trip B. Oral evaluation of government programs. C. Student writen reports on the influence of government on cropping programs.

Code: 01.01020103-01

Title - PLANNING THE CROPPING PROGRAM

AGRICULTURA

OBJECTIVES BY UNIT	CONTENT
Objective #4 Determine the cropping program on the basis of the physical farm situation.	A. Suitability of cropping program based on physical facilities. . Fields . location of field in relation to buildings . shape . size of fields . special problems . wet . stony B. Labor requirements and availability . Full time . Part time C. Equipment requirements . Specialized . General purpose D. Storage facilities . Capacity . Age and condition . Convenience
Objective #5 Determine the needs for forage and grains by various classes of livestock.	A. Using the home farm or sample farm: . Determine number of animal units . Determine feeding requirements for a unit for feeding season for forage. . Determine the total amounts of forage needed for feeding season. (This can be expressed in terms of tons or H.E.) Grain requirements may be calculated in a similar manner. B. Determination of needs for average animal based on production either in TDN lbs. or converted pounds of grain. C. Determination of total needs for the various classes of livestock.
Objective #6 Determine the benefit of rotation vs. mono cropping system.	A. Rotation vs. mono cropping . Soil structure . Drainage . Weed control . Disease control . Insect pests . Plant residue . Erosion . Fertility

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and group discussion of the physical facilities necessary for various crops. . Study farm maps for field conditions. . Determination of labor distribution requirements B. Discussion of machines necessary for various crops with emphasis on machine that may be more versatile. C. Comparison of work units required for various crops (compare 10 years ago with present time) D. Field trip to farm to examine storage facilities for capacity - convenience - condition.	A. Figure work units for crops grown on farms now and 10 years ago. B. Prepare charts showing labor distribution for various crops. C. Make lists of machines necessary for various crops D. Calculate storage capacity of facilities in bins, mows, cribs, silos, and sheds for various crops.	A. Written report by the student based on a specific situation. B. A written evaluation of the influence of physical facilities. C. Written quiz on calculation of storage facilities.
A. Lecture, discussion, and calculations of: . Animal units . Feeding rates . Length of feeding season . Calculations of animal units . Feeding rates and length of feeding season	A. Using home situations students determine number of animal units, length of feeding season, and tons of forage needed. B. Use of tables for calculation of needs of various classes of livestock. Calculate the concentrates needed for specific livestock enterprises.	A. Written quiz to test the ability of students to calculate forage and grain requirements of livestock.
A. Lecture and supervised study using references of prepared ditto. B. Field trip to several fields contrasting the two systems with desired and undesired results.	A. Written notes from readings and from board materials B. Evaluation of sites as to success and failures with reasons.	A. Written test on advantages and disadvantages of rotation and mono cropping systems. B. Oral participation as to value of a system in a given situation.

Code - 01.01020103-01

AGRICULTURAL

Title - PLANNING THE CROPPING PROGRAM

OBJECTIVES BY UNIT	CONTENT
Unit 2- **Determining** the soil productivity. Objective #7. Determine the yield of crops on a farm under various situations of management and soil condition.	A. Determination yields/acre . Silage corn . standing in field . crop in silo . tower . bunker . Grain corn . conversion from silage . ear corn . grain . Small grain . Hay B. Determine yield on basis of soil conditions . Soil name or type . Drainage class . Slope . Erosion . Fertility level.
Unit 3 - Selecting the crops and varieties to use. Objective #8. Select crop species and varieties suitable for a cropping program of a given farm on the basis of climate, soil and physical situation.	A. Forage Crops Selection Factors . General . Early cutting . Seasonal sequence of cutting 1st cut . Repeat cuttings . Soil condition . Yield 1 acre - cut and season . Combination compatability . Disease resistance . Amount of seed available B. Legume variety selection . Alfalfa . Birdsfoot trefoil . Clovers C. Grasses . Timothy . Brome grass . Orchard grass D. Special Situation Materials E. Corn . Growth degrees . Elevation . Soil conditions . Standability . Disease resistance F. Small grains . oats . barley . wheat . buckwheat G. Special purpose crops . summer annuals . emergency hay (forage) crops . soybeans . sugarbeets . crown vetch H. Other local crops.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - Discussion of methods used to determine yields. B. Field trip to sites as crops are being harvested to determine yields/acre under differing conditions. C. Examination of crop record books for yields per acre for area farms by yields. D. Comparison of yields in terms of index number based on soil conditions - comparison with county averages or other. E. Field trips to sites to determine **results of soil test information.** Cornell soil test results or other agency testing program. Extension demonstration photos for techniques and yield comparisons.	A. Determine yields of various crops on the home or cooperative farm. B. Review soil productivity index charts. C. Collect soil samples using soil augers. D. Test samples for pH levels. Sample soil and determine drainage - slope - erosion level.	A. Written quizzes covering yield determination and index calculations. B. Sampling soil - and testing techniques. C. Lab exercise on soil testing using unknown samples, grade students on lab techniques and accuracy of results.
A. Use Cornell Recommends for Forage Crops as primary reference for individual study. B. Identification of seed samples (plant mounts) - slides and pictures . Legumes . Grasses . Special crops C. Field trip to local seed dealer to discuss prices, availability of seed and recommendations for given years . Tape interviews may be substituted. D. Examination of sales literature of seed from local seed dealers.	A. Determination of varieties to use for situations on a given farm. B. Seed and plant identification. C. Students make a list of acceptable crops and varieties for the home farm.	A. Written report of selection of crop species and varieties that meet the criteria established for a given situation.

Code - 01.01020103-01

Title - PLANNING THE CROPPING PROGRAM

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Crop Inputs Objective 9 Determine inputs that are required for the production of a crop and the possible anticipated returns.	Factors to Consider A. Land resources B. Labor requirement . Number of individuals . Hours . Distribution of labor force C. Equipment and machinery . Number of units . Efficiency in operation D. Seed E. Fertilizer F. Chemicals . Herbicides . Insecticides . Pesticides G. Total capital requirements H. Value of crop return for investments.
Unit 5 - Determining the Crop Requirements for a Specific Enterprise or Market. Objective #10 Prepare a comprehensive plan for a farm cropping program	A. Students are to plan a cropping program for a given farm given a set of conditions or for the home farm that will reflect the mastery of previous work. . Climate . Soils . Physical conditions of the farm . Governmental programs . Needs for livestock (if applicable) . Select varieties and plan seeding rates reflecting items.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Using cost account figures for the given crops. Farm management handbook & Extension Service information and data from school demonstration plots - Determine the inputs and costs involved in producing crops under varying conditions. B. Field trip to sites to observe the crop at varying stages from planting, growing through harvesting. C. For crop(s) grown on school demonstration area have students calculate the input and returns to determine profitableness of proposed enterprise(s).	A. Calculating the costs of inputs and returns of various crops. B. Determine profitableness of a given crop in a given situation. C. Complete a crop demonstration cost account project.	A. Observation of student ability to select crops on the basis of inputs to returns in given situations. Oral reasons for selections and inputs used. B. Evaluation of field trip reports or demonstration plot projects.
A. Demonstrate using the chalkboard for application of skills in determining the cropping program. B. Use a sample farm situation. C. Use Farm SCS Maps D. Overhead transparencies of charts and pages from sample farm.	A. Students work out trial cropping programs using appropriate work sheets. B. Preparation of final programs showing justifications for program. C. Plan a cropping program for the land laboratory or crop demonstration project.	A. Written plan for a cropping program for a given farm that will work satisfactorily for a period of from 5 to 10 years with thoughtful justifications for all fields of the farm. B. Provide credit for actual work completed by students developing comprehensive cropping programs on the home farm, crop demonstration plots and land laboratory.

MODULE OF INSTRUCTION

Title - PLANNING THE CROPPING PROGRAM Code - 01.01020103-01

RESOURCE MATERIALS

A. Books - Crop Production, 3rd edition
DeLorit and Henry L. Ahlgren. Prentice-Hall Inc.
Doane's Farm Management Guide
Farm Crop Production Technology
OE - 81016
Yearbook of Agriculture - 1957 Soil
Modern Farm Management Handbook - Hall & Morrison -Interstate
Modern Corn Production - Aldrich & Leng - F&W Publishing Corp. - (Farm Quarterly), Cincinnati, Ohio
Modern Soybean Production - Aldrich - F&W Publishing Corp. - Cincinnati
Farm Soils - E.L. Worthen & S.R. Aldrich - Wiley
Farm Mangement Handbook - Department of Agricultural Economics, College of Agriculture, I.M.S.
Producing Farm Crops - Wilson & Richer - Interstate

B. Bulletins - Spring Grain - Cornell Ext. Bulletin 1181
Soils and soil associations of New York - Cornell Ext. Bulletin 930.
Soil Areas of ------- County - County Agricultural Agents.
What is Conservation Farm Plan - Leaflet 249 - U.S.D.A.

C. Periodicals -
Cornell Recommends for Field Crops current publication
Successful Farming Magazines
Farm Journal Magazines
Hoards Dairymen Magazines
What's Cropping Up - Agronomy Department - College of Agriculture

D. Audiovisuals - ASCS or SCS - Aerial View of areas - showing locations of farm, fields, etc.
Farm Maps and SCS Conservation Plans.
Plant Hardiness Zone Maps.

MODULE OF INSTRUCTION

Title - GROWING THE CROP Code - 01.01020103-02

DESCRIPTION:

The student will be involved in the preparation of the soil, timing of planting, planting, and culture of the crop. Conventional tillage and minimum tillage methods will be compared. The care of seeds, planting depth, width of rows, plant population, fertilization, and lime requirements will be discussed.

Controlling insects, diseases, and weeds will be discussed. The use of the proper insecticides and herbicides will be included in this instruction.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Choosing the crops	1	1
2. Limiting factors of crop production	2	3
3. Preparing to plant the crop	1	7
4. Planting the crop	1	4
5. Controlling weeds, insects, and diseases	4	3
6. Crop records	1	2
	10	20

Revised February 1975

MODULE OF INSTRUCTION

Title - GROWING THE CROP Code - 01.01020103-02

OBJECTIVES to be obtained:

The student will be able to:

1. Develop reasons or justification for growing a crop or crops.
2. List six limiting factors in the production of given crops without the use of references.
3. List all cultural practices to be used in growing selected crops at the highest profit level, given production data.
4. Select amounts and types of fertilizer and seeds for selected crops, given adequate information.
5. Operate, to the instructor's satisfaction, tillage equipment used to grow selected crops.
6. Clean, calibrate, and operate, to the instructor's satisfaction equipment used to plant selected crops.
7. Identify ten weeds that affect production of selected crops and correctly list two effective methods of controlling each weed.
8. Identify five insects that may affect crop production, and indicate one effective method of controlling each.
9. Identify five diseases that may affect crop production and indicate one effective method controlling each.
10. Keep, to the instructor's satisfaction, cost, materials, and labor records for the crop(s) grown.
11. Use the problem solving method to solve a given problem related to the growing of a specific crop, using necessary references.

Code - 01.020103-02

Title - GROWING THE CROP

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Choosing the crops Objective #1 Develop reasons or justification for growing a crop or crops.	A. To grow for sale as cash crops B. To use as an animal feed in the farm business (convert to milk or meat). C. To grow for sale at roadside stands D. To have own project for work experience and money. . Demonstration project . FFA money raising project . Family farm . Individual student project
Unit 2 - Limiting factors of crop production Objective #2 List six limiting factors in the production of given crops without the use of references.	A. Seed bed preparation B. Plant population - and spacing C. Moisture D. Fertility E. Weeds F. Insects G. Diseases H. Time of planting I. Proper timing of application of chemicals for - E - F - G.

E D U C A T I O N

01.01020103-02 - Code

GROWING THE CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Compare TDN output of forage and grain crops common to school area. . Class discussion B. Show cost accounts of profitability of cash crops - (Grains- Roughages) C. Show - summarized crop records from files of other years' record. D. Give examples of several cropping programs in school district and how they fit into the farm business.	A. Make computations (using Cornell farm business Analysis sheets - (top 10%) to gain TDN output of forage and grain crops. B. Make notes on return/hr of labor if it is a cash crop. C. Determine how crop will fit into present farm business. D. Determine if choice of crop will prove financially rewarding . Anticipated - returns . Less expenses . Probable profit margin	A. Written test on - . Computations on business records . Anticipated expenses and returns. B. Evaluate students ability to consider crop alternatives - for his home farm business. C. Written report on crop demonstration, FFA or individual student crop project.
A. Lecture - discussion to present information (slides will be useful). B. Trip to field where the student will plant crop in to evaluate limiting factors. Field trip to FFA demonstration plot or extension service research plots.	A. Take notes on information presented. B. Observe and record limiting factors in field where crop will be planted. C. Have students apply information learned to the home farm or demonstration plot situations.	A. Written or oral test. List 6 limiting factors. B. Evaluate students ability to detect limiting factors in a selected field. C. Give credit for hands on type work performed by any student involved in supervised work experience programs.

Code - 01.01020103-02

Title - GROWING THE CROP

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Preparing to plant the crop Objective #3 List all cultural practices to be used in growing selected crops at the highest profit level, given production data	A. The following will be considered for each of the selected crops: . Soil preparation prior to planting . Planting the crop - . time . depth . seeding rate . fertilizer rate . plant spacing B. Controlling weeds, insects, and diseases . Mechanical means . Chemical means C. Special cultural practices . Irrigation , Top dressing
Objective #4 Select amounts and types of fertilizer and seeds for selected crops, given adequate information	A. Fertilizer and limitations . Taking and interpreting soil tests . Types of fertilizer to apply - ratios . Amount of fertilizer to apply - analysis . Time of application . Methods of application B. Seeds . Varieties - and their advantages . Hybrid seed - explanation of . Adaptability to climate - growing season . Sources of seed . Experiences of local farmers . Prices

EDUCATION

01.01020103-02 - Code

GROWING THE CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Prepare a laboratory work sheet(s) on exercise that students can fill out B. Teacher discuss above work sheet or lab exercise in class. C. Problem solving to determine cultural practices to use on school demonstration project or on student's home farm.	A. Students complete lab exercise or work sheets on recommended cultural practices. Class discussion to follow. B. Students complete work sheets and make necessary changes . C. Use the problem solving method to determine cultural practices on school demonstration project.	A. Written test on cultural practices for particular crop will be given.
A. Use prepared lab exercise written by teacher to help students research new information. B. Lecture - discussions to present information. C. Demonstration . Taking soil samples . Soil testing for pH . Interpreting test results D. Field trip to local fertilizer and seed sales. E. Field trip to demonstration area to obtain soil samples and map area.	A. Students complete study exercise on fertilizer and seeds. Class discussion to follow plus problem solving B. Take notes on new information C. Take soil samples - send in for testing for pH, P_2O_5, K_2O and nitrogen Determine amounts of lime to apply for selected crops. D. Take notes on prices. Recommendations. Methods of application.	A. Written test on fertilizer analysis prices - best buy and on seed varieties recommended. B. Evaluate students ability to take soil samples and understand test results. C. Evaluate students ability to select correct fertilizer for a given situation. D. Written or oral test on lime-liming-and reading of pH scale. E. Make out a written lab report on selecting seeds and fertilizer. F. Lab test on unknown soil samples for lime, N.P.K.

Code - 01.01020103-02

Title - GROWING THE CROP

OBJECTIVES BY UNIT	CONTENT
Objective #5 Operate, to the instructor's satisfaction, tillage equipment used to grow selected crops.	A. Purposes of tillage equipment . Loosen soil . Provide air and water spaces . Develop proper seed bed for seed to germinate . Provide type of medium adaptable B. Types of tillage equipment C. Operating tillage equipment . Safety . Efficiency . Field adjustments . Calibration methods
Unit 4 - Planting the Crop Objective #6 Clean, calibrate, and operate, to the instructor's satisfaction equipment used to plant selected crops.	A. Types of Planting equipment . Grain drills . Corn planters . Spreaders . Broadcasters B. Preparing equipment for planting . Cleaning equipment . Lubricating equipment . Calibrating equipment C. Operating planting equipment . Safety . Efficiency . Field adjustments

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture, demonstration to present information. B. Supervised study to determine tillage equipment used for selected crops. C. Student reporting D. Demonstration of how to operate equipment E. Student practice, supervised work experience at land lab.	A. Students will determine what tillage equipment to use for selected crops and report their findings to the class. B. Students will operate tillage equipment used for growing a selected crop.	A. Observe students operating machinery Evaluate: . Safety . Efficiency . Ability to make adjustments B. Written report on safety as it relates to operating tillage equipment.
A. Field trip to machinery dealer(s) to observe types of planting equipment B. Demonstration of cleaning, lubricating and operating planting equipment C. Student practice at school, home farm or cooperative farm.	A. Develop list of different planting equipment used in the area and indicate crops planted with each. B. Clean, lubricate and calibrate at least a corn planter and a grain drill. C. Operate planting equipment.	A. Written or oral test to determine if student knows: . Types of planting equipment and its uses. . Calculations to calibrate equipment B. Evaluate student's ability to clean, lubricate, calibrate and operate at least the corn planter and grain drill, in terms of: . Safety . Efficiency . Accuracy

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Controlling weeds, insects, and diseases Objective #7 Identify ten weeds that affect production of selected crops and correctly list two effective methods of controlling each weed.	A. Weeds affecting crop production . Identification . Methods of control . Herbicides available . Forms - granular - liquid . Application - methods . Timing
Objective #8 Identify five insects that may affect crop production, and indicate one effective method of controlling each.	A. Insects affecting crop production . Identification B. Method of control . Biological . Chemical

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Group consensus to determine ten or more weeds affecting area. Use slides or mounts. B. Supervised study to determine effective control measures. Use work sheets made by teacher. C. Student discussion of work sheets. D. Student practice of weed identification E. Demonstration on sprayer and nozzles, pressures - cleaning and calibrating. F. Review recent Cornell Recommends on latest information and restrictions - lab exercise.	A. Determine weeds affecting area by: . Memory of past problems . Field trip to observe current situation . Discussion with area farmers - custom applicators. B. Individually determine methods of controlling selected weeds, and report on work sheet and hold class discussion. C. Study weed specimens for identification. D. If possible apply weed control measures to school crop demonstration or on local crop. E. Complete lab exercise and discuss dilution, rates of application, and timing.	A. Weed identification test. B. Written or oral test on methods of controlling selected weeds. C. Observe the students practicing changing nozzles and pressure and checking PSI and gallonage applied D. Field trip to observe results of weed spraying - students write a field trip report.
A. Group consensus to determine insects affecting area. Slides or mounts if available. B. Supervised study to determine effective control measures. Lab - exercise to be used C. Student discussion of lab exercise above D. Student practice of insect identification E. Review recent pesticide recommendations for the cropping season. F. Invite a custom applicator to class for a discussion on insect control.	A. Determine insects affecting area by: . Memory of past problems . Field trip to observe current situation . Discussion with area farmers or extension agent B. Individually determine methods of controlling insects - complete lab exercise. C. Study insect specimens for identification D. If possible apply insect control measures to school crop demonstration or on other local crop. Use 1 or 3 gal. spray - outfit E. Complete lab exercise on names of chemicals and their dilution and time of application.	A. Insect identification B. Written or oral test on chemicals and/or methods of controlling selected insects. C. Class to make field observation if practical. D. Oral test on nozzles PSI - Dilution - and timing. E. Oral questions on results of field observations or written field trip report.

Code - 01.01020103-02

Title - GROWING THE CROP

OBJECTIVES BY UNIT	CONTENT
Objective #9 Identify five diseases that may affect crop production and indicate one effective method of controlling each.	A. Field crop diseases . Symptoms . Method of control . Fungicides available . Forms . Application - methods . Timing
Unit 6 - Crop Records Objective # 10 Keep, to the instructor's satisfaction, cost, materials, and labor records for the crop(s) grown.	A. Cost records . Seed bed preparation . Planting cost . Fertilizer cost . Seed cost . Chemical cost . Cultivating cost . Harvesting cost . Other handling costs . General farm expenses (overhead) B. Materials records . Amounts of all materials used . Name and grade of all materials used C. Labor records . Types of labor . Hours of labor . Cost of labor D. Field observation records . Observations of deficiencies, weeds, insects or diseases. . Plant populations E. Methods of keeping records

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Group concensus to determine major field crop diseases in the area. Use pictures - slides - mounts. B. Supervised study to determine effective control measures. Use work sheets made by teacher. C. Student discussion of work sheets. D. Student practice of disease identification. E. Field trip to farmer who has disease problems. Invite a custom applicator to class for a discussion on diseases.	A. Determine diseases affecting area by: . Memory of past problems . Discussion with area farmers or extension agent . Field study of current situation if possible. B. Individually determine methods of controlling area crop diseases and report on work sheet and hold class discussion. C. Study disease specimens or pictures for identification; make a collection if possible D. If possible apply disease control measures to school crop demonstration or observe custom operator in action.	A. Disease identification B. Written or oral test on controlling selected crop diseases.
A. Lecture - discussions to present information (attached DeKalb record forms may be useful.) Custom operator - costs. B. Supervised study Students keep records on crop grown. C. Field trip to secure information for records.	A. Students will keep information on crop throughout module and record it at the end of the module. Use system recommended by Cornell IMS Service and ATANY B. Students will observe different crop record forms which can be displayed in class.	A. Evaluate students completed records. B. Written test on crop cost account project.

OBJECTIVES BY UNIT	CONTENT
Objective #11 Use the problem solving method to solve a given problem related to the growing of a specific crop, using necessary references.	A. Steps in problem solving method B. Information describing problem to solve. Example of problems . Determining a variety to plant . Determining amount and analysis of fertilizer . Determining tillage methods . Determining row spacings - plant population

01.01020103-02 - Code

GROWING THE CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion to present background information. B. Teacher develop work sheets with problems.	A. Record information needed to solve the problem B. Individually use the problem solving method C. Report on specific crop problems and solutions to the problems on the home farm, cooperative farm or school demonstration plot.	A. Evaluate results of student's work. B. Each student write an overall plan for growing a crop. Plan to be 300 words or longer. C. Oral answers to specific crop problem situations.

MODULE OF INSTRUCTION

Title - GROWING THE CROP Code - 01.01020103-02

RESOURCE MATERIALS

A. Periodicals -
- Insects - Ident. Manual - Calif. State Poly Tech.
- DeKalb Crop Management
- Successful Farming. Soils and Crops
- Crops and Soils - agronomy society

B. Bulletins -
- Our Land and Its Care - American Potash Inst.
- Cornell Recommends for Field Crops Current Issue
- Cornell Recommend for Vegetable Crops - U.S.D.A.
- Doans Farm Management Guide
- Field and Crop Record - Cornell bulletin (25¢)
- Spring Grains for New York State - Cornell #E1181
- Birdsfoot Trefoil - Cornell #E111D
- Common Foliar Diseases of Alfalfa and Clover - Cornell E1205
- Forages: Production Utilization, Harvesting - Cornell S39
- Potash on Alfalfa Pays - Cornell S81
- Hunger signs in Crops - Cornell IMS $.15
- Minimum Tillage - Cornell IMS. $.15
- Weed Control - Cultural and Chemical - Cornell IMS $2.00
- Demonstrations in Farm Crops - Cornell IMS - $1.40

C. Books -
- Hunger Signs and Crops
- Crop Production 3rd Edition Prentice - Hall, Inc., Englewood Cliff, New Jersey
- Farm Management Handbook 1967 - Cornell Agricultural Economics

D. Audio-Visual -
- DeKalb film strips on Limiting Factors
- American Potash Institute Slides Fertilizer deficiencies
- DeKalb corn achievement forms
- Specimens of weeds, insects and diseases
- Farm Business Chart
- Fundamentals of Plant Identification 18 color slides and script - Cornell IMS $12.25
- Worksheets for slide set - $.25
- Weeds Identification and Control - 77 slides - Cornell IMS - $12.25
- Identification of weeds parts 1+2 - Cornell IMS - $5.15
- Know Your Weeds - Cornell IMS -$15.30
- - See IMS catalog for other aids

Sample of a Worksheet
Fertilizer Applications
Plans of four farmers in our area.

Spring 1973

	N	P	K
James Post & Sons			
1. Corn on alfalfa sod			
400 lbs of 10-10-10			
2. Sweet corn on alfalfa sod			
alfalfa sod........................			
15 loads of cow manure.............			
400 lbs of 10-10-10................			
total nutrients for corn...............			
3. Oats			
200 lbs of 10-10-10			
Arnold Duppengieser & Sons			
1. Corn			
_______ lbs of 32% N. solution	100		
400 lbs of 10-20-20			
Total nutrients for corn			
2. Oats			
200 lbs of 10-20-20			
Gordon Richards & Son			
1. Corn			
_______ lbs of Ammonium Nitrate	60		
400 lbs of 15-15-15			
Total nutrients for corn			
2. Corn			
plow down...........................			
250 lbs of 15-15-15			
_______ lbs of NH_4NO_3			
Total nutrients			
Van Slykes in Castile Twp			
1. Corn			
200 lbs of urea			
100 lbs of muriate			
125 lbs of 18-46-0			
Total nutrients			

MODULE OF INSTRUCTION

Title - HARVESTING FIELD CROPS Code - 01.01020103-03

DESCRIPTION:

Students will develop skills in selecting weather conditions favorable to harvesting, determining optimum time to harvest crops, selecting, preparing and adjustment equipment for harvest crops. Students will analyze modern grain and forage crop harvesting systems.

The safe and efficient operation of harvesting equipment will be studied by students. Machinery and equipment adjustments for optimum efficiecny will be discussed.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Determining when to harvest field crops	3	5
2. Harvesting methods and procedures	2	8
3. Adjusting harvesting equipment	3	9
	8	22

Revised February, 1975

MODULE OF INSTRUCTION

Title - HARVESTING FIELD CROPS

Code - 01.01020103-03

OBJECTIVES to be obtained:

The student will be able to:

1. Describe with 18% accuracy, four, four-day weather forecasts during a three week period, using all available information.
2. Correctly determine when to harvest five selected field crops to obtain maximum digestible nutrients per acre.
3. List five modern methods used to harvest field crops and list the machinery required for each method.
4. Use the problem solving method to select and justify, to the instructor's satisfaction, equipment used to harvest a crop in a given situation.
5. Determine, to the instructor's satisfaction, the amount of crop loss during harvesting, in a given situation.
6. Perform three adjustments on five harvesting machines to decrease the amount of crop left in the field.

01.01020103-03
HARVESTING FIELD CROPS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Determining when to harvest field crops Objective #1 Describe with 80% accuracy four, four-day weather forecasts during a three week period using all available information	A. Sources of weather information . Television . Radio . Newspaper . U.S. weather bureau - telephone . Visual observation . Other B. Interpreting weather information . Reading weather maps . Identifying clouds and their effect . Interpreting barometric pressure changes . Interpreting humidity readings . Evaluating satellite pictures . Predicting frontal movements C. Agricultural weather forecasting . Applying information to local situation
Objective #2 Correctly determine when to harvest five selected field crops to obtain maximum digestible nutrients per acre	A. Effect of maturity on digestible nutrients per acre . Corn silage . Hay . Grain . Haylage B. Measuring maturity in field crops . Stage of flowering . Stage of seed development . Moisture content . Color . Total yield . Digestibility . Other

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to present information B. Demonstrations on interpreting weather information C. Outdoor classes to obtain weather readings D. Student practice using equipment and information to forecast weather.	A. Take notes on new information B. Use information to make weather forecasts for four four-day periods	A. Evaluate student forecasts for accuracy. B. Written test on key words used in weather forecasting.
A. Lecture to present information B. Demonstrations . Crops at different stages of development . Using moisture testers . Estimating total yield C. Student practice at school land laboratory crop demonstration plot.	A. Students practice determining when to harvest various crops. B. Students use references to calculate nutrient differences at various stages of maturity for various crops.	A. Test students ability to determine if given crops should be harvested either on field trips or from samples in class.

01.01020103-03

HARVESTING FIELD CROPS

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Harvesting Methods and Procedures Objective #3 List five modern methods used to harvest field crops and list the machinery required for each method.	A. Factors to consider in selecting methods of harvesting crops. . Cost per acre harvested . Use of the crop . Equipment available . Time required . Field loss acceptable . Other B. Methods of harvesting field crops . Making hay . Making haylage . Use of the crop . Chopping . Harvesting grain . High moisture corn . Other C. Equipment required for various methods of harvesting
Objective #4 Use the problem solving method to select and justify, to the instructors satisfaction, equipment used to harvest a crop in a given situation.	A. Steps in problem solving method B. Description of situation (should be an actual situation)

EDUCATION

01.01020103-03 - Code

HARVESTING FIELD CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to present information B. Problem solving method to demonstrate the process of selecting a harvesting method. C. Individual supervised study student reporting to determine the equipment required for harvesting method. D. Field trip(s) to farm or machinery dealership.	A. Students take note of new information. B. Students assist in problem solving method C. Each student select a method of harvesting crops and determine all the equipment that could be used to harvest it then report findings to class. D. Observe equipment and its uses during field trip(s).	A. Written test listing . 5 modern methods of harvesting crops . Machinery required for each method B. Written reports on methods used to harvest forages and grains on the home farm.
A. Individual instruction B. Supervised study	A. Solve given problem during supervised study	A. Evaluate students completed problem. B. Oral report regarding a specific crop and situation.

Code - 01.01020103-03

Title - HARVESTING FIELD CROPS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Adjusting harvesting equipment Objective #5 Determine to the instructor's satisfaction, the amount of crop loss during harvesting, in a given situation.	A. Types of crop loss during harvesting . Crop left standing . Crop cut then dropped by harvester in field . Losses from cutting too high . Losses between field and storage area B. Measuring field loss . Estimate total crop - sample and weigh a given area . Sample and weigh amount left in given representative area after harvesting . $\frac{\text{Amount left X 100}}{\text{total amount}} = \%\text{ loss}$ C. Determining causes of field loss . Improper equipment adjustment . Improper equipment operation . Defective equipment . Crop too mature . Weather conditions . Other
Objective #6 Perform three adjustments on five harvesting machines to decrease the amount of crop left in the field	A. Adjusting harvesting to decrease field loss (using operators manuals) . Speed changes . Sharpening cutters . Adjusting pickup teeth . Adjusting fans, sieves, and shakers . Adjusting knotters . Adjusting rollers . Other B. Using operators manual to troubleshoot causes of incomplete harvesting . Mowers . Rakes . Clippers . Choppers . Balers . Combines

01.01020103-03 - Code

HARVESTING FIELD CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to present information B. Demonstration of technique and calculations C. Student practice on field trips.	A. Take notes on new information B. Practice determining crop losses during field trips and/or home farm	A. Have students determine field loss in a crop working in teams of two.
A. Demonstration of adjustments on farms or at dealerships B. Student practice C. Films showing machinery adjustments and operations. D. Adult farm field days to demonstrate harvesting: . Hay . Haylage . Cornsilage . High moisture corn . Ear corn . Small grains	A. Students practice making adjustments on harvesting machinery in the field. B. Calculate decrease in field loss after making adjustments.	A. Observe students as they make adjustments - use a check sheet to record each student's progress. B. Written report on major types of equipment used for specific crop enterprises. Students should explain the major adjustments and key points in operating the equipment.

Course FPM

Name of Module Harvesting FIELD CROPS

RESOURCE MATERIAL:

A. Periodicals -

Soils and Crops
Successful Farming - Soils and Crops

Books -

Crop Production. Third ed. Delorit - Ahlgren Prentice-Hall, Inc.
Doanes Farm Management Guide.

Combines and Combining, Ohio, available from IMS for $2.05

Audio-Visual -

Slides - American Potash Institute

Wheat Grading Factors, Oat Kernel Damage, Corn Kernel Damage colored pictures from IMS - 10¢ each

B. Bulletins -

Cornell Extension bulletins #E1059, #1107, S39, S67
Operators Manuals for Harvesting Equipment

MODULE OF INSTRUCTION

Title - STORING THE FIELD CROP

Code - 01.01020103-04

DESCRIPTION:

The farmer must insure that he has adequate storage facilities to store the crops he produces. He must select the storage facility that will maintain the quality of feed stored. Crops must be protected from weather damage, excessive moisture, heat build-up, and rodents. The student will investigate the types of bins, cribs, and storage facilities as each is related to a specific crop. The advantages and limitations of storage facilities will be investigated. The economics involved in selecting storage facilities will be emphasized.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Selecting Storage Facilities	3	8
2. Hazards Encountered in Storing Crops	3	3
3. Methods of Storing Field and Forage Crops	3	10
	9	21

Revised April 1974

MODULE OF INSTRUCTION

Title - STORING THE FIELD CROP

Code - 01.01020103-04

OBJECTIVES to be obtained:

The student will be able to:

1. Correctly recommend and describe, to the instructors satisfaction, five types of facilities used to store field crops grown in the local area. Determine relative costs and returns of five types of storage facilities.
2. Correctly calculate the volume and weights of crops in storage areas shaped as a square, rectangle, pyramid, cylinder, cone or irregular given the dimensions of the structure and unit weights of the crop.
3. Use the problem solving method to correctly select safe, protective, and economical storage facilities for given field crops in a given situation.
4. List ten safety hazards associated with storing selected field crops, and describe the preventative steps that may be taken for each hazard listed.
5. Demonstrate to the instructors satisfaction, ability to properly perform the mechanical operations involved in storing hay, silage, and grain in their respective structures.
6. Demonstrate to the instructors satisfaction the ability to make at least ten recommended adjustments on equipment used in the process of storing field crops.
7. Determine the relative quality of silage, hay, and grain taken from storage facilities given several samples.

Code - 01.01020103-04

AGRICULTURAL

Title - STORING THE FIELD CROP

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Selecting storage facilities Objective 1 Correctly recommend and describe, to the instructors satisfaction, five types of facilities used to store field crops grown in the local area. Determine the relative costs and returns of five types of storage facilities.	A. Types of storage facilities . Mow storage . Silos . upright . air tight . conventional . trench . bunker . Corn cribs . Bins . Other B. Construction of storage facilities . Materials used . Strength . Longevity . Versatility . Protection given stored crop . Other C. Advantages and limitations of types of storage facilities . Cost per unit of crop stored . Keeping quality of contents . Ease of handling materials . Versatility of structure . Deterent to rodents and pests . Other

01.01020103-04 - Code

STORING THE FIELD CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion to present new information.	A. Take notes on new information presented.	A. Written and/or oral test.
B. Supervised study and student reporting.	B. Select a storage facility and use references to find information concerning structure (A-H) and advantages and limitations (A-H) then report findings to the class.	B. Write report on field trips.
C. Visit farmer who likes glass lined silos.	C. Take notes on field trip.	C. Instructors to checks students' progress in this study. Grade notebooks.
D. Visit farmer who likes concrete silos.	D. Observe - gather cost figures - hold discussion.	D. Written quiz on - costs and advantages and limitations of specific storage facilities.
E. Visit a farm where there is new construction - storage.	E. Determine the cost to go from a mow system to an all haylage (silo) system including - automatic unloaders and feeders.	
F. Visit a farm that has no silos - hay is stored in mow.	F. Students make notations and comparisons - list types of storages - and under each give - advantages, disadvantages.	
G. Teacher to get cost data for storage facilities for silages and for grains.		
H. Invite resource people in Extension Service and field men from companies that sell storage facilities and equipment.		

Code - 01.01020103-04

Title - STORING THE FIELD CROP

OBJECTIVES BY UNIT	CONTENT
Objective 2 Correctly calculate the volume and weights of crops in storage areas shaped as a square, rectangle, pyramid, cylinder, cone or irregular given the dimensions of the structure and unit weights of the crop.	A. Finding Volumes of storage facilities (Pages 53-64- Arithmetic in Agriculture) . Square or rectangle Volume = length X width X height . Cylinders Volume = πr^2 X height . Cones and pyramids Volume = area of base X height ÷ 3 . Irregular volumes Break into squares, rectangles, cylinders, cones or pyramids. B. Determining Weight of material in facilities . Amount = No. of units in structure X weight per unit. . Weights per unit of crops as found in references - Farm Management Handbook (Cornell) or Arithmetic in Agriculture. . Sample calculating found in references.
Objective 3 Use the problem solving method to correctly select safe, protective, and economical storage facilities for given field crops in a given situation.	A. Steps in problem solving method B. Factors to consider in selecting storage facilities from Objective 1 C. Information pertinent to problem students will solve - preferably an actual situation.

01.01020103-04 - Code

STORING THE FIELD CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture-discussion to present information. B. Demonstration to show methods. Teacher use overhead projector for calculations. C. Student practice solving problems. D. Field trip to determine volume of storage areas.	A. Take notes of new information. B. Solve practice problems. C. Solve problems during field trip.	A. Written test on volume problems. B. Evaluation of problems solved on field trip.
A. Lecture-discussion to present information. B. Supervised study using problem solving method. C. Teacher make up work sheets, sample attached.	A. Solve given problem using problem solving method. Assume you need storage to feed herd of 100 dairy cows plus replacements. Determine hay equivalent needed per cow - total tons storage needed - Determine crops to be grown, yields and storage capacity needed.	A. Evaluate results of problem student has solved. B. Make a chart of storage facilities on your farm and for each, give dimensions, storage capacity in tons and/or bushels. C. Develop a plan for changes in storage facilities or methods you would like to see in the future.

Code - 01.01020103-04

Title - STORING THE FIELD CROP

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Hazards encountered in storing crops. Objective 4 List ten safety hazards associated with storing selected field crops, and describe the preventative steps that may be taken for each hazard listed.	A. Safety hazards in Storing field crops. . Sources of information about potential hazards . operators manuals . bulletins . periodicals . farmers . agencies - extension, 4-H, safety councils . personal experience . other . Types of Hazards . running machinery . falls . poisonous gases . fires . suffocation . respiratory infections from dust . other . Preventative steps to decrease hazards
Unit 3 - Methods of storing field and forage crops. Objective 5 Demonstrate to the instructors satisfaction, ability to properly perform the mechanical operations involved in storing hay, silage, and grain in their respective structures.	A. Hay Storage . Working with elevators . Stacking hay . Other B. Silage storage . Operating the blower . Distribution of silage . Other C. Grain storage . Working with elevators . Providing ventilation . Determining moisture content . Other D. Ear Corn storage . Providing ventilation . Controlling rodents and pests . Other

01.01020103-04 - Code

STORING THE FIELD CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion. B. Demonstration of literature concerned with farm safety. C. Resource personnel if available. D. Supervised study and student reporting. E. Group consensus.	A. Take notes on new information. B. Each student develop a list of hazards associated with crop storage on his farm, work experience station, or a neighboring farm and indicate preventative steps for each hazard. C. Discuss hazards and preventative steps in class group discussion. D. Keep a classroom bulletin board on accidents and farm safety.	A. Written test B. Evaluate students' survey of hazards.
A. Demonstrations B. Field trips to observe and practice proper procedure. C. Visit custom grain drying operation . Determine costs of drying grain . Cost of storing grain . Trucking back to farm D. Teacher prepare work sheet that will illustrate the returns that may be gained by storing grain at harvest and selling next spring.	A. Observe demonstrations B. Practice storing crops during field trips. C. Observe operation - . Make notes on costs based on moisture percentages. . Determine moisture content of several grain samples brought in by students. D. Determine value of storing grain vs. selling it at harvest. Consider ASCS - government loan storage.	A. Evaluate students a they perform operations on field trips. B. Written quiz on costs of drying and storing 1,000 bushels of corn - with 30% moisture. C. Develop a plan for your farm for storing either shelled corn or corn on the cob.

Code - 01.01020103-04

Title - STORING THE FIELD CROP

OBJECTIVES BY UNIT	CONTENT
Objective 6 Demonstrate to the instructors satisfaction the ability to make at least ten recommended adjustments on equipment used in the process of storing field crops.	A. Adjustments on equipment as given in operators manual. . Drying fans . Elevators - hay, auger and paddle type . Unloading wagons . Forage blowers . Forage harvestors
Objective 7 Determine the relative quality of silage, hay, and grain taken from storage facilities given several samples.	A. Factors to consider in evaluating field crop quality. . Maturity of sample . Color . Odor . Freedom of disease or insect damage . Freedom of weather damage . Foreign particles present . Size of sample . Digestibility and nutrient content - (forage testing) . Other

EDUCATION

01.01020103-04 - Code

STORING THE FIELD CROP - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration B. Student practice on home farm or cooperative farm. C. Field trips.	A. Observe and take notes during demonstrations. B. Practice making adjustments recommended in operator's manuals.	A. Evaluate students ability to make recommended adjustments. B. Written quiz on safety.
A. Lecture-discussion to present factors to consider. B. Demonstration of differences C. Student practice at evaluating quality. . Visit a farmer or borrow his reports on complete analysis of several of his feeds. D. Use IMS sheet - Forage Crop Judging (FFA Contest) - and set up a lesson in judging. E. Use IMS sheet on wheat - oat or corn kernel damage. F. Lab exercise on determining quality of roughages and grains.	A. Take notes on factors to consider in evaluating crop samples. B. Practice determining relative quality of crop samples. C. Send sample for complete analysis to college of agriculture - Study the report. D. Discussion of samples set up by teacher after student evaluation. E. Observe pictures shown and quality of grains - make a list of U.S.D.A. grades for two grains - get prices on different grain grades.	A. Crop sample placement test based on quality. B. Use IMS Sheet Forage Crop Judging C. Oral exam on what a complete feed analysis shown. D. Judge 10 samples of forages and/or grains. Use FFA Forage Crop Judging Sheets.

MODULE OF INSTRUCTION

Title - STORING THE FIELD CROP Code - 01.01020103-04

RESOURCE MATERIALS

A. Periodicals - Soils and Crops
Successful Farming - Soils and Crops and Harvesting issues
Farm Safety - Rural Safety Council

B. Books - Crop Production. Third ed. Delorit - Ahlgren Prentice-Hall, Inc.
Doanes Farm Management Guide.
Farm Management Handbook - Cornell
-Arithmetic in Agriculture - Interstate Printers and Publishers

C. Audio-Visuals -
Wheat grading Factors, Oat kernel damage, corn kernel damage, colored pictures from I.M.S., $10 each
Slides - American Potash Institute
Slides - Harvesting and Storing Medium Moisture Hay Crop Silage, 30 slides - $5.50 - I.M.S.
Harvesting and Storing High moisture Corn - 38 slides - $6.00 - I.M.S.

D. Bulletins -
Operator's Manuals for equipment used in teaching module.
Cornell Extension Bulletins #E1008, E1057, S37, E994, E353.
Drying Shelled Corn - $.20 from I.M.S.
IMS - Cornell - Forage Crops Judging Sheet - FFA Contest Form used at State Fair.

SAMPLE **SAMPLE**

Storing Field Crops
Lab Worksheet
Objective 3

Plan a new storage facility for this farmer who is unhappy using a bunker silo for silage and he has lost his labor force who has helped him mow hay.

He plans to grow -
A. 150 acres of corn - for silage
B. 50 acres of corn - for grain
C. 150 acres of corn - for alfalfa hay
D. 50 acres of corn - for oats

Using top 10% yields from Cornell Business Analysis Sheet - develop - an upright silo system for: a) Corn silage b) Corn grain (high moisture) c) Haylage - and d) Grain (steel bin) Assume dry hay will be used in - feeding young calves to one year of age.

Alternatives - determine - advantages and limitations of each. He will use two self unloading wagons to do the feeding in a bunk.

a. Glass lined silo system
b. Combination - harvestor - concrete stove or continuous poured concrete silos - unloaders included
c. All concrete silos
d. All wood silos -

______ ______ tons storage ______ X ______ Harvestor = $ ______

______ ______ tons storage ______ X ______ Concrete Stove = ______

______ ______ tons storage ______ X ______ ______________ = ______

______ ______ tons storage ______ X ______ ______________ = ______

______ ______ tons storage ______ X ______ ______________ = ______

______ ______ tons Storage ______ X ______ ______________ = ______

Oats ______ Bu storage ______ X ______ Steel Bin = ______

SAMPLE **SAMPLE**

Storing the Field Crop
Lab Worksheet
Field Trip
Objective #1

____
NAME OF STUDENT

1. Farm of ______________________ Visited ______________(DATE)

2. Kind of operation dairy beef cash crop other.

3. Animals carried next fall and winter -

______________ cows ______________ replacements
______________ animals ______________ other

4. Crops grown past growing season -

Acres	Name of Crop	Yield Acre	Total Tons

5. Storage facilities on this farm - get sizes

Name of Crop	How Stored	Size of Storage	Tonnage

6. Farmers comments - advantages and disadvantages of each facility -

____
____
____
____
____
____

MODULE OF INSTRUCTION

Title - WEED CONTROL IN FIELD CROPS

Code - 01.01020103-05

DESCRIPTION:

The super production of most crops is usually expected in American agriculture. For this reason our society has been able to enjoy an abundance of available nourishment exceeded by no other country in the world. Extensive knowledge in the areas of soils, fertilization, pesticides and herbicides has greatly assisted our farmers in their successful crop production.

This module deals with the control of weeds through proper tillage and use of herbicides.

The student will be involved with weed identification and categorization and the selection of chemical and mechanical weed control methods available today to facilitate greater production.

Emphasis will be placed upon proper selection of herbicides and safe handling of the chemicals and equipment used in weed control.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Identification of weeds	2	8
2. Mechanical weed control	0	1
3. Chemical weed control	1	7
4. Safe use of machinery and chemicals	1	10
	4	26

Revised April, 1974

MODULE OF INSTRUCTION

Title - WEED CONTROL IN FIELD CROPS

Code - 01.01020103-05

OBJECTIVES to be obtained:

The student will be able to:

1. Prepare a working definition of the term Weed.
2. Prepare a list of 25 weeds common to the area and categorize each as a broad or narrow leaf variety and whether they are annuals, biennials or perennials.
3. Collect and preserve 15 different specimens of weeds found in the area.
4. Identify, by using a key, and to the instructors satisfaction each of 15 specimens collected.
5. List and compare reasons for using mechanical weed control.
6. List ten different chemicals used to control weeds and note any government regulations pertaining to each.
7. Make a chart including each of the ten chemicals in Objective 5 and show which weeds each is effective against and the crops each protects.
8. Select a control which has been proven effective on each of the 15 specimens collected and note the proper stage of growth to apply the control.
9. List and demonstrate 15 precautions to use when working with weed control chemicals and machinery.
10. Calibrate to the instructor's satisfaction a sprayer which will be used to apply a herbicide.
11. Demonstrate to the instructors satisfaction the procedure to use when applying a chemical herbicide.

Code - 01.01020103-05

Title - WEED CONTROL IN FIELD CROPS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identification of weeds Objective 1 Prepare a working definition of the term Weed.	A. Definition of Weed . A plant out of place
Objective 2 Prepare a list of 25 weeds common to the area and categorize each as a broad or narrow leaf variety and whether they are annuals, biennials or perennials.	A. Field and forage weed ident - FFA B. Vegetable crops ident - FFA contest
Objective 3 Collect and preserve 15 different specimens of weeds found in the area.	A. Field activity B. Collect 30 common weeds in the area

EDUCATION

01.01020103-05 - Code

WEED CONTROL IN FIELD CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study of weeds . Weeds--presentation of filmstrips, mounts, slides, movies. . Weeds--of the North Central States--go through 20 pictures and point out difference in structure. . Develop vocabulary on leaf characteristics.	A. Write notes in notebook B. Write definitions from three different references in notebook and from these three extrapolate a definition which can be used in weed control. C. Make drawings of--leaf characteristics from new vocabulary.	A. Collect and evaluate each student's definition. B. Notebook evaluation
A. Supervised study . Weeds of the Northeast B. Slide presentation . Weed Identification and control . film strips C. Classroom mounts D. Slides made by teacher E. Weed charts	A. Use Cornell IMS - FFA Contest Field & Forage and Vegetable Crop - Weed sheets to select the weeds to use . Check those known by student first . Question farmers and herbicide sales companies to acquire the weeds most common to the area. B. Observe slides, pictures or mounts and learn special characteristics as pointed out in class discussion.	A. Teacher and student evaluation of the list compiled. B. Written quiz at end of each period. Final quiz on 25 weeds. Use IMS forms.
A. Supervised collection B. Field trip C. Teacher demonstrate collectio and preservation D. Weed charts	A. Select and collect different weeds discovered on the field trip. (use newspaper or magazines) B. Preserve specimens for further use and observation. C. Student collection of weeds from home farms or demonstration area.	A. Teacher evaluation of collection and preservation.

Code - 01.01020103-05

Title - WEED CONTROL IN FIELD CROPS

OBJECTIVES BY UNIT	CONTENT
Objective 4 Identify by using a key and to the instructors satisfaction each of 15 specimens collected.	A. Weed identification key . Leaf shapes . Leaf sizes . Colors . Stem shapes . Presence of hairs B. Identification of common weeds . Agri-business company charts
Unit 2 - Mechanical Weed Control Objective 5 List and compare reasons for using mechanical weed control.	A. Tillage B. Mulching C. Mowing . Time . Cost . Results
Unit 3 - Chemical Weed Control Objective 6 List ten different chemicals used to control weeds and note any government regulations pertaining to each.	A. Chemicals . 2,4-D . Cyanamid . Pre-emergence sprays . 2, 4-5T . Silvex . Methoxychlor . Paraquat . Malathion . 4 - (2,4-DB) . Ammonium sulfate . Sodium arsenite . Simazine . Amitrol-T . Atrazine . DiNitro . Dowpon . Sutan . Eptam B. Safety procedures involved when working with chemicals.

01.01020103-05 - Code

WEED CONTROL IN FIELD CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture on use of key B. Demonstration of the use of the key C. Supervised student use of the weed identification key D. Lab exercise	A. Take notes on lecture and demonstration B. Practice using the key C. Identify and record names of each specimen	A. Teacher evaluation of students identifications
A. Lecture on economics of weed control cost per acre B. Panel discussion C. Supervised study D. Invite field man of agri-business to class. Discuss mechanical and chemical weed control	A. Note taking B. Panel discussion--three people for mechanical methods vs chemical sprays C. Prepare costs per acre for using chemicals vs mechanical tillage	A. Teacher and student evaluation of discussion B. Written essay questions on mechanical weed control.
A. Demonstration. Calculate cost per acre to control specific weeds in corn and forage crops. Use work sheet. B. Guest speakers . Cooperating agricultural chemical companies . Extension specialist C. Supervised study . Use Cornell Recommends to complete a work sheet . Discuss ecological aspects of herbicides	A. Take notes and fill in work sheet on costs. Calculate cost of various chemicals B. Note taking and questions from guest speakers C. Prepare a list of chemicals, the weeds they control and specific regulations on each. D. Hold class discussion on dangers of some herbicides.	A. Oral quiz on demonstration B. Have each student prepare a plan for his farm for using herbicides. Give dilutions, names of chemicals, rates of application and costs. C. Quiz on chemical safety.

Code - 01.01020103-05

Title - WEED CONTROL IN FIELD CROPS

OBJECTIVES BY UNIT	CONTENT
Objective 7 Make a chart including each of the 10 chemicals in Objective 6 and show which weeds each is effective against and the crops each protects.	A. Chemicals . Pre-emergence sprays . Attrex . 2,4-D . Silvex . Eptam . Sutan . Simazine . Malathion . Sodium arsenite . Methoxychlor B. Weeds killed C. Crop protected
Objective 8 Select a control which has been proven effective on each of the 15 specimens collected and note the proper stage of growth to apply the control.	A. Pre-emergence B. Post emergence
Unit 4 - Safe use of machinery Objective 9 List and demonstrate 15 precautions to use when working with weed control chemicals and machinery.	A. Categories . Tractor operation . Calibration of equipment (residual effect) . Labeling . Storage B. Safety . Handling of chemicals . Storage of chemicals . Disposal of containers C. Chemical applicator certification . Private . Commercial

01.01020103-05 - Code

WEED CONTROL IN FIELD CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study common weeds B. Supervised study common crops grown in the area C. Supervised study chemical weed controls for crops D. Film strips and movies on weed control	A. Make the chart and file in notebook . Chart may show many options possible	A. Teacher evaluation of the chart B. Written test on 10 chemicals used to control weeds in forage and grain crops grown in the area.
A. Lecture B. Supervised study C. Field trip to farm using herbicides D. Slide presentation on common weed controls	A. Note taking B. Add to the chart previously made a notation stating stage of growth to apply control.	A. Teacher evaluation of chart and notes B. Oral quiz on major weed controls for forage and grain crops common in the area.
A. Supervised study using booklet: Agriculture Chemical Safety B. Review in discussion of safe tractor operation C. Equipment safety D. Cooperative extension educational program E. Environmental Conservation Department examination for chemical certification permits.	A. Record in notebook the precautions to be used when using chemicals. B. Prepare a list of safe tractor operation rules to be reviewed by instructor. C. Chemical applicators permit, regulations	A. Oral or written exam on 15 precautions when using agricultural chemicals. B. Test on safe use of machinery when applying chemicals.

OBJECTIVES BY UNIT	CONTENT
Objective 10 Calibrate, to the instructor's satisfaction, a sprayer which will be used to apply a herbicide.	A. Spray equipment . Hand operated--small . Machine operated--large
Objective 11 Demonstrate to the instructors satisfaction, the procedure to use when applying a chemical herbicide	A. Setting up equipment B. Check calibration C. Prepare chemical solutions D. Safety

EDUCATION

01.01020103-05 - Code

WEED CONTROL IN FIELD CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration of use of each type by machinery dealer, or farmer who uses this equipment. B. Prepare a worksheet of steps to be used in operation. C. Supervised work experience. D. Learn parts of a sprayer, run the pump, calibrate water expended using the calibrating jar.	A. Observation of demonstrations B. Question any poorly understood parts. C. Complete the worksheet. D. Label drawing, showing sprayer parts, study nozzle size, psi and output.	A. Teacher evaluation of student operation. B. Collect worksheets and evaluate. C. Oral test on sprayer . Nomenclature
A. Demonstration by teacher. Run sprayer at three different tractor road speeds and at different psi settings. Note gallonage delivered, change nozzle size and repeat above. B. Demonstration on mixing a liquid with water to get proper dilution. C. Demonstration on mixing a wettable powder. D. Demonstration and trouble shooting--plugged sprayer lines, tips, or bad pump.	A. Observe demonstration and repeat later by student teams or groups. B. Make a chart showing gal/acre delivered in six different situations using a calibrating jar. C. Observe demonstration by class members, repeat later. Have students work in small groups or teams.	A. Written test. Have students determine how much chemical and how much water is needed to spray X acres for X crop to kill X variety of weeds. B. Students' demonstration and how to mix ingredients with water. C. Performance grading on students' work in their demonstrations in applying chemical herbicides.

MODULE OF INSTRUCTION

Title - WEED CONTROL IN FIELD CROPS Code - 01.01020103-05

RESOURCE MATERIALS

Books: Weed Control: as a science, Klingman, John Wiley & Sons, Inc.
Approved Practices in Pasture Mgt., McVikar and McVikar, Interstate
Weeds, Muenscher, Macmillan Co.
Weeds of the North Central States, Agric. Exp. Station, Univ. of Ill., Circular 1
Weeds of the North East, Phillips, Univ of Del., Ag. Exper. Station, Newark Delaware

Bulletins: Cornell Ext. Bull. 1147 - Killing Undesirable Vegetation with Chemicals
Cornell Ext. Bull. 769 - Chemical Weeding
Cornell Ext. Bull. 1154 - Poison Ivy, Poison Sumac
4-H Leaders' Guide L-10-1 Know Your Weeds
Agway Chemical Guide - Current Year

Audio Visuals -

1. Quack Grass Control, Slide set
   IMS Cornell University, Stone Hall
2. Weed Ident. and Control, Slide Series
   IMS Cornell University, Stone Hall
3. Kodachrome Slide sets - (loan or purchase) Visuals Office
   Roberts Hall - Cornell University or Film Library
4. Weed Mounts (on loan) - Vegetable Crops Specialist
   New York State College of Agriculture
5. Movie - Battle Report - The Underground War on Weeds -
   Public Relations Department - Elanco Products Co. P.O. Box 1968
   Indianapolis, Indiana 46206

Operation of a Low Gallonage Sprayer
Lab Work Sheet

Example

Name____________________

____________ 1. A low gallonage sprayer will deliver about ______ to ______ gallons of water per acre.

____________ 2. An __________ is used to keep chemicals in suspension.

____________ 3. A ___________ will keep foreign particles out of the pressure lines.

____________ 4. The pumps are made of ______________________(material)

____________ 5. In an 8004 tip the first 80 stands for ___________

____________ 6. Extra solution that doesn't go to the nozzles is fed back to the tank through a _________ _________ _________.

____________ 7. A _________ is held within the female body of a nozzle.

____________ 8. Atrazine is used to ________________________ in __________ (crop).

____________ 9. 2, 4-D is used to ________________________ in ____________ (crop).

____________10. Chemical which will control mosquitos around the home ____________________.

____________11. _________ounces of this chemical to _____ _____ gal water is a good dilution for insect control.

____________12. _________________ is a chemical which will clean out a sprayer with 2, 4-D residue.

____________13. _________________ will clean out a sprayer that had atrazine in it.

____________14. 15.16.- List below three separate ways to control amount of solution applied per acre.

_____________________ ___________________ ____________

____________17. _____________________ a kind of metal that will not corrode.

____________18. The 200 gal. tank we saw was made of ________________

____________19. When using a calibrating jar - a practice runway ____________ feet long is used as a test strip.

____________20. If I want to apply 40 gallons of solution per acre I must use __80__ tip at _____lbs psi at __________mph. (See a booklet)

Weed Control
Lab Work Sheet - Example

NAME____________________

____________________1. Name the material used to control broad leaved weeds in corn and in lawns.

____________________2. An 8004 tip means something. What does the first 80 mean?

____________________3. What does the 04 mean?

____________________4. The amount of liquid applied per acre...increases or decreases as the tip is changed from an 8002 to an 8004 tip.

____________________5. Name the material which will control grasses in corn?

____________________6. In what form does his material come in?

____________________7. In what form is it applied?

____________________8. To get a solution down close to the corn weeds...__________ are used on the sprayer.

____________________9. In calibrating a sprayer .... a strip ______________ rods long is used.

____________________10. A ____________ jar is used to measure the amount of liquid being applied.

____________________11. The spacing between the nozzles may be _______ or ________ inches.

____________________12. The sprayer we used yesterday.... sprayed the solution in a broadcast.... or bands.

____________________13. One gallon of water weighs about ______lbs while one gallon of liquid nitrogen weighs ___________lbs.

____________________ 14. If I sprayed 18 gallons of liquid nitrogen per acre... how many pounds of this material was I putting on per acre?

____________________15. If liquid nitrogen tests 32%... how much actual nitrogen was I putting on in problem 14 above?

____________________16. What kinds of material should I use to remove the 2, 4-D residue from a tank.... which I want to use to spray beans for insects?

____________________17. How can I remove atrazine residue from a tank...which I want ..... to clean so I can spray alfalfa for insects. Atrazine residue will kill alfalfa.

____________________18. A farmer chooses to spray corn for grasses ... before the corn is up.... this is called a ______________treatment.

____________________19. The sprayer we used yesterday will spray... any liquid. Name three kinds of .... different materials which may be sprayed out.... ____________________ __________________ __________

20. On the back of this sheet solve for the following problems:

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Continued

a. What nozzle size, mph, and psi will I need to apply 300 lbs of liquid N. per acre?

b. What nozzle size, mph, and psi will I need to apply 12 gal. of water and 1 pint of 2, 4-D per acre?

c. I want to get a tank of atrazine ready for 20 acres of corn. How much water will I need to put into the tank. How much atrazine will I need to put into the tank?

MODULE OF INSTRUCTION

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD

Code - 01.01020105-01

DESCRIPTION:

The apple producer must always keep his orchard healthy to produce at maximum capacity. Trees that no longer produce must be removed and new trees established. Students will be involved with the selection of apple varieties, planting systems and rootstocks based on soil and climatic conditions. They will develop plans to maintain orchard nutrition and practice method of pollination, pruning, training and tree propagation.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Planting systems and rootstocks	3	3
2. Variety Selection	2	2
3. Fruit Tree Nutrition and Orchard Soils	2	4
4. Basic Pollination Procedures	1	2
5. Pruning and Training	2	4
6. Basic methods of tree propagation	1	1
7. Orchard Pest Control	1	2
	12	18

Revised March, 1975

MODULE OF INSTRUCTION

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD
Code - 01.01020105-01

OBJECTIVES to be obtained:

The student will be able to:

1. Evaluate orchard planting systems and select a planting system based upon given conditions.
2. Compare characteristics of common rootstocks and make selections based upon managerial factors.
3. Identify primary varieties of apples and make selections for local planting.
4. Identify the physical characteristics of orchard soils.
5. Identify physical limitations of orchard soils and be able to make recommendations for improving drainage.
6. Take soil samples, interpret the results of a comprehensive soil analysis and make necessary recommendations for nutrient requirements.
7. Develop a pollination schedule.
8. Prune young and establsihed trees.
9. Reproduce demonstrated methods of grafting.
10. Discuss additional methods of tree propagation
11. Make pest control recommendations based upon accepted standards and outline a program for the orchard*

* Additional pest control covered in modules 01.01020105-2 (Controlling Apple Diseases) and 01.01020105-3 (Controlling Apple Insects)

Code - 01.01020105-01

AGRICULTURAL

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Planting systems and rootstocks Objective #1 The student will be able to evaluate orchard planting systems and select a planting system based upon given conditions.	A. Location of Orchards . Climatic factors . temperature . wind . sun . hail . rainfall . Topographic factors . air flow . buffers B. Planting Systems . Low Density (75-150 trees/acre) . Medium density (200-300 trees/acre) . High density (400-800 trees/acre) . Ultra High density (over 800 trees/acre)
Objective #2 The student will be able to compare characteristics of common rootstocks and make selection based on managerial factors	A. Rootstock characteristics . Nursery . propagation . disease problems . insect problems . growth character . Field . anchorage . growth character . soil conditions . disease problems . insect problems . spacing
Unit 2 - Selection of apple varieties Objective #3 The student will be able to identify primary apple varieties and make selections for local planting	A. Variety characteristics . Fruit . size . color . quality . storage ability B. Structure - growth habit C. Ripening D. Bearing character E. Disease resistance F. Spacing

EDUCATION

- Code
- Title

01.01020105-01
THE CULTURAL AND MANAGEMENT PRACTICES
OF THE APPLE ORCHARD

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Demonstration C. Field trips D. Supervised student research (Ref. 2)	A. Students will develop a site plan for model orchard with factors supplied by teacher based on local conditions. B. Field trips to orchards to consider location factors	A. Compare student plans with working sites.
A. Lecture outline (Ref. 1)	A. Field trips to various density planting sites	A. Written report
A. Lecture - demonstration B. Field trip to orchard C. Compile basic comparison chart (Rootstock vs factors) D. Assign students research for class reports.	A. Students collect variety specimens for class display. B. Research report based on Ref. 1 bulletins and trade catalogs.	A. Identification test of main commercial varieties and varieties of local importance. B. Oral report C. Written quiz on related material

Code - 01.01020105-01

AGRICULTURAL

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Fruit Tree Nutrition and Orchard Soils Objective #4 The student will be able to identify the physical characteristics of orchard soils.	A. Soil requirements of orchards . Drainage . Water holding capacity . Aeration . Depth favorable to roots B. Physical characteristics of orchard soils . Texture . Structure . Color . Stoniness . Tilth . Slope . pH . Mottling
Objective #5 The student will be able to recognize physical limitations of orchard soils and be able to make recommendations for improving drainage.	A. Soil Characteristics affecting productivity . Permeability (drainage class) . Depth favorable to roots . Moisture holding capacity . Ease of cultivation B. Treatments to improve drainage and productivity . Diversion ditches . Open ditches . Tile

Objective #6
The student will be able to take soil samples, interpret the results of a comprehensive soil analysis and make necessary recommendations for nutrient requirements.
	A. Soil Testing
	. pH
	. Comprehensive soil analysis
	  . sample collection
	  . handling
	  . results
	  . recommendations
	. Fertilizer application

Unit 4 - Basic pollination procedures
Objective # 7
The student will be able to develop a pollination schedule.
	A. Principles of pollination
	. Methods
	. Flower parts
	. Fertilization
	. Problems
	  . cross pollination
	  . timing
	. Aids
	B. Causes of poor fruit set

01.01020105-01 - Code

THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Outline apple tree soil requirements	A. Using "Land Judging Scorecard" have students check characteristics on demonstration sites	A. Test - list physical characteristics.
A. List physical characteristics of soil (Slide series) B. Field demonstration	A. Hold soil judging contest	A. Compare student scorecards to standards
A. Lecture B. Demonstration C. SCS soil specialist D. Field trip - tile installation, ditches	A. Visit orchards B. Gather cost information and maintenance facts	A. Student report on problem situation
A. Field demonstration by teacher or fertilizer company fieldman B. Lecture - demonstration	A. Each student collect samples from local farms B. Each student interpret results of test and develop a fertilizer program based on his samples	A. Comparison to test site with extra credit possible for individual plans
A. Lecture - demonstration B. Bulletin (CU 1146) C. Class visit bookkeeper D. Film - pollination	A. Check orchard layout observe and/or open working hive	A. Compile pollination schedule for a working orchard with several varieties

Code - 01.01020105-01

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Pruning and Training Objective #8 The student will be able to prune young and established apple trees	A. Function of pruning . Stimulate growth . Shaping . Tree strength . Harvest ease B. Heading C. Leader training D. Timing . Young trees . Established trees . tender varieties . hardy varieties E. Methods and Procedures . Tools (hand and pneumatic) . Type of cuts . Mechanical
Unit 6 - Basic methods of tree propagation Objective #9 The student will be able to reproduce demonstrated methods of grafting	A. Principles of grafting B. Types of grafting . Bridge . Cleft , Bud . Others C. Procedures
Objective #10 Students will be shown and be able to discuss additional methods of tree propagation	A. Types . Inlay . Whip . Others
Unit 7 - Orchard Pest Control* Objective #11 Students will be able to make pest control recommendations based upon accepted standards and outline a program for the apple orchard *Complete coverage in modules #01.01020105-02 and # 01.01020105-03 - Controlling apple diseases and controlling apple insects	A. Major Disease problems B. Major insect problems C. Spray or Control scheduling D. Animal Pest

01.01020105-01 - Code

THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture illustration with prepared examples B. Demonstration - in class and in field C. Ditto worksheet on pruning problems (IMS AV 216 Pruning Masters)	A. Supervised pruning by students in a working orchard B. Pruning of school or nearby trees.	A. Identification quiz on tools and explanation of use B. Individual demonstration on a tree in need of pruning . C. Student will mark wood to be pruned on printed example.
A. Lecture - field demonstration of mechanical pruners. B. Trade or extension programs	A. Observe operation and take notes: operating principles . cost . labor . time . tree damage	A. Student managerial report
A. Demonstration B. Field trip to commercial nursery	A. Notes - practice	A. Students will do a: bridge ,cleft bud
A. Field trip to commercial nursery		
A. Lecture B. Cornell recommendations C. Trade recommendations D. Pesticide fieldman	A. Chart basic spray program for a local or the student's orchard. Class discussion of plans.	A. Class reports

MODULE OF INSTRUCTION

Title - The Cultural and Management Practices of the Apple Orchard   Code - 01.01020105-01

RESOURCE MATERIALS

Books:

Modern Fruit Science,	Norman Childers	Horticultural Publ.
Apple Planting Systems,	R.L. Norton	Extension Specialist $2.00
Pruning Handbook		

Bulletins:

Tree Fruit Recommendations N.Y.S. College of Agriculture	
Planting and Early Care of the Apple Orchard	CU 384
Cultural Practices in the Bearing Orchard	CU 1212
Apple Varieties of New York State	CU 1174
Pollination and Fruit Development of Tree Fruits	CU 1146
Control of Wildlife Damage in Orchards	CU 1055
Orchard Soils	
Land Judging in New York	CU 904
Factors Affecting Chemical Thinning of Apples	Geneva
Search, Vol 1 # 2 Apple Cultivars	Geneva
Propagating Fruit Trees	Geneva #773
Plant Science Information Bulletins CU	
Special Research Reports CU and Geneva	
Top-working and Bridge-grafting Fruit Trees	CU 882
Establishing and Managing Young Apple Orchards	USDA 1897

Masters: AV 216 Pruning CU IMS

Field Trips: NYS Horticultural Society Winter Show Rochester
Kingston

Extension Demonstration Plots and Plantings

Trade Field Demonstrations

Nurseries

Films - available from trade sources

MODULE OF INSTRUCTION

Title - CONTROLLING APPLE DISEASES Code - 01.01020105-02

DESCRIPTION:

This module will enable the student to identify both major and minor diseases of the apple orchard. The student will develop a working knowledge of primary recommendations to control major disease problems at the proper time and be able to safely handle and operate application equipment.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Identification of apple diseases	3	3
2. Disease life cycles	3	2
3. Spray recommendations (fungicides)	2	4
4. Spray application-preparation and equipment operation	4	7
5. Safety	1	1
	13	17

Revised March, 1975

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MODULE OF INSTRUCTION

Title - CONTROLLING FRUIT DISEASES - APPLES   Code - 01.01020105-02

OBJECTIVES to be obtained:

The student will be able to:

1. Identify the following major apple diseases at important stages of their development:

   Apple scab
   Brown rot
   Cherry viruses
   Fireblight
   Root knot nematode
   Powdery Mildew

2. Discuss minor apple diseases.
3. Outline the life cycle of the above diseases.
4. Identify field damage of apple diseases and make recommendations to correct or control the problem.
5. Develop a spray program to control problem orchard diseases based upon acceptable recommended materials.
6. Mix spray materials safely, calibrate equipment and apply materials at proper rate.

Code - 01.01020105-02

Title - CONTROLLING APPLE DISEASES

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identification of apple diseases Objective #1 The student will be able to identify the following apple diseases at important stages of their development: . Apple scab cherry viruses . Brown rot powdery mildew . Fireblight rootknot nematode Objective #2 The student will be able to discus minor apple diseases.	A. Apple Disease Classification . Fungus . Bacterial . Virus B. Disease Conditions (growth and development) C. Disease Identification . Damage . tree . fruit . Development . conditions . appearance . Transmission
Unit 2 - Disease life cycles Objective #3 The student will be able to outline the life cycle of all major apple diseases	A. Diseases Life Cycles . Dormant . Active . characteristics . conditions . timing . Period of effective control
Unit 3 - Spray recommendations (fungicides) Objective #4 The student will be able to identify field damage of apple diseases and make recommendations to correct or control the problem. Objective #5 The student will be able to develop a spray program to control problem orchard diseases based upon acceptable recommendations.	A. Materials classification B. Compatibility C. Legal restrictions (pesticide laws) D. Effectiveness of control

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Demonstration C. Prepared disease mounts or illustrations . Disease on tree . Disease on fruit . Stages of development . Method of transmission	A. Take notes B. Visit orchard and conduct disease inventory C. Collect disease samples or commercial advertisements of diseases. D. Plot life cycle chart for each major disease	A. Identification quiz all major or locally important diseases . damage . type . transmission
A. Lecture B. Prepare ditto handout for each disease C. Orchard observation D. Slides	A. Complete disease ditto B. Student reports on each disease C. Collect five field samples D. Inventory a diseased orchard	A. Grade completed ditto and notes B. Field samples C. Quiz
A. Lecture B. Demonstration C. Resource person . Spray material man . Extension specialist . Conservationist	A. Compare material ingredients using Cornell Recommendations and trade guides develop a spray program using acceptable materials for a test orchard.	A. Grade schedule and selection of materials

Code - 01.01020501-02

Title - CONTROLLING APPLE DISEASES

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Spray application - preparation and equipment operation Objective #6 The student will be able to mix spray materials safely, calibrate equipment and apply materials at the proper rate.	A. Pesticide Safety . Storage . Handling . Mixing . First Aid B. Pesticide mixing procedure C. Calibration of spray application equipment D. Operation of spray application equipment . Types . Principles of operation . Service and maintenance . Operation

EDUCATION 01.01020105-02 - Code

CONTROLLING APPLE DISEASES - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Demonstration C. Resource Person D. Film	A. Pesticide safety program B. Present safety demonstration	A. Outline safety procedures and list hazards B. Each student demonstrate pesticide mixing
A. Lecture - Demonstration B. Lecture - Demonstration C. Lecture - Demonstration D. Field trip . Equipment dealer . Orchard . Trade shows E. Operation and Service checklist F. Film	A. Students measure and mix sample materials. B. Calibrate main types C. Prepare applicator for operation performing all service and maintenance operations. D. Operate equipment under field conditions	A. Observation of student safety habits and procedur B. Check accuracy C. Compare to check list D. Observe operation E. Quiz

MODULE OF INSTRUCTION

Title - Controlling Apple Diseases   Code - 01.01020105-02

RESOURCE MATERIALS

Books:
Modern Fruit Science, Norman Childers Horticultural Publ.
Approved Practices in Fruit Production, Scheer and Juergenson Interstate Publ.

Bulletins:	Tree Fruit Recommendations	N.Y.S. College of Agriculture	
	Cultural Practices in the Bearing Apple Orchard	CU	1212
	Planting Practices for Control of Cherry Yellows Virus Complex	CU	1066
	Combating Replant Problens inOrchards	CU	1169
	Five-Year Study of Fire Blight	CU	963
	Insects and Diseases of Stone Fruit Trees	CU	1113
	Aircraft for Orchard Disease Control	Geneva	8
	Petroleum Oils for Control of Orchard Pest	"	814
	Pesticides and You	Chemical-Pesticides Publ #	6
	Pesticide register	G.L. Mack (Geneva)	
	Power Sprayers and Dusters	USDA	2223
	Establishing and Managing Young Apple Orchards	USDA	1897

Field Trips: NYS Horticultural Society Winter Show

Demonstration Programs

Local Orchards

Films available from trade sources

MODULE OF INSTRUCTION

Title - CONTROLLING APPLE INSECTS

Code - 01.01020105-03

DESCRIPTION:

This module will enable the student to identify the primary insect pest of appples. In addition life cycles of these insects will be studied and the damage caused by them. The student will develop a working knowledge of spray materials and recommendations with skills necessary to operate equipment and aply insecticides. Students will be able to identify field injury resulting from insects and be exposed to new techniques in insect control.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Identification of apply insects and their damage	3	6
2. Insect life cycles	4	2
3. Spray recommendations	3	1
4. Spray application - preparation and equipment operation	2	4
5. Safety	1	2
6. Insect trap techniques and monitoring	½	1½
	13½	16½

Revised June, 1974

MODULE OF INSTRUCTION

Title - CONTROLLING APPLE INSECTS

Code - 01.01020105-03

OBJECTIVES to be obtained:

The student will be able to:

1. Identify the following major insect pests of the apple orchard at important stages of their life cycles:

    - Apple maggot
    - Mites - E.R.M. & 2 spotted
    - Red-banded leaf roller
    - Coddling moth
    - Aphids - green and rosy
    - Oriental fruit moth
    - Plum curculio
    - Peach tree borer

2. Discuss minor apple insect pests and effective measures of control.
3. Recognize field damage caused by problem insects in the apple orchard.
4. Outline the life cycles of the above insects and be able to specify optimum periods for effective control.
5. Categorize spray materials and compile or organize a program to control orchard insect pests based on accepted recommendations.
6. Mix spray materials safely, calibrate application equipment and apply materials at proper rate.
7. Discuss biological control of insect pests and methods of monitoring.

Code - 01.01020105-03

Title - CONTROLLING APPLE INSECTS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identification of apple insects Objective #1 The student will be able to identify the following major insect pest of the apple orchard at important stages of their life cycle: Apple maggot Mites - E. R. M. & 2 spotted Red banded leaf roller Coddling moth Aphid - green and rosy Oriental fruit moth Plum curculio Peach tree borer	A. Basic Entomology (General Introduction) B. Insect Characteristics . Head . Thorax (legs & wings) . Abdomen C. Types of Orchard Insect Pest . Chewing . Sucking . Lapping D. Insect Development (Metamorphosis) . Egg . Larvae . Pupa . Adult
Objective #2 The student will be able to discuss minor or other insect pest of local importance and effective measures of control.	A. Types of field damage . Trees . Fruit B. Characteristics of Damage C. Economic Effect
Objective #3 The student will be able to recognize field damage caused by problem insects in the apple orchard.	
Unit 2 - Insect life cycles Objective #4 The student will be able to outline the life cycle of the above insects and be able to specify optimum periods for effective control.	A. Life Cycles B. Feeding Habit C. Field Damage

EDUCATION

01.01020105-03 - Code

CONTROLLING APPLE INSECTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture -using chalk - board and overhead B. Lead class discussion to select major pest C. Prepared mounts or trade illustrations on display D. Movie E. Demonstration F. Field trip	A. Complete picture of typical insect identifying parts B. Each collect five insect specimens C. Collect five examples of insect field damage	A. Identification quiz . Parts . Insects . Damage B. Specimen collection
A. Lecture B. Ditto Handouts C. Trade Materials D. Field trip to orchard E. Movie	A. Inventory orchard for insect damage B. Compare fruit damage and discuss effect on price. C. Hold insect and insect damage contest.	A. Identification quiz B. Written report.
A. Lecture outline B. Ditto-life cycles C. Supervised class research	A. Chart life cycle of all major insect pest indicating optimum time of control.	A. Collect notes B. Quiz

Code - 01.01020105-03

Title - CONTROLLING APPLE INSECTS

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Spray recommendations Objective #5 The student will be able to categorize spray material and to compile or organize a program to control orchard insect pest based on accepted recommendations	A. Types of Spray Materials . Adjuvants . wetting agents . spreaders . stickers . penetrants . emulsifiers . dispersants . Insecticides . petroleum oils (dormant) . lead arsenate (inorganic) . phosphate (contact or internal) . Acaricides (mites) . Organic Compounds B. Physical compatibility C. Application period
Unit 4 - Spray application - preparation and equipment operation Objective #6 The student will be able to mix spray materials safely, calibrate application equipment and apply materials at proper rate.	A. Pesticide Safety . Storage . Handling . Mixing . First Aid B. Pesticide mixing procedure C. Calibration of spray application equipment D. Operation of pesticide application equipment . Types . Principles of operation . Service and maintenance . Operation
Unit 6 - Insect trap techniques and monitoring Objective #7 The student will be able to discuss biological control of insect pest and methods of monitoring	A. Biological controls . Predators . Set pheronome trap B. Insect monitoring

EDUCATION

01.01020205-03 - Code

CONTROLLING APPLE INSECTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Demonstration C. Movie D. Worksheet	A. Develop worksheet comparing materials. B. Each student report on an assigned material C. Obtain trade materials for comparison and evaluation	A. Worksheets B. Reports C. Quiz
A. Demonstration B. Lecture-Demonstration C. Lecture D. Demonstration E. Resource person F. Field trip: . Dealer . Orchard		
A. Resource person . Spray representative B. Lecture C. Demonstration D. Demonstration E. Field Trip: . Dealer . Orchard . Equipment show or demonstration	A. Develop program using local conditions with compatible materials B. Mix simulated materials under supervision C. Pesticide safety contest or program D. Demonstration E. Calibrate equipment under test and field conditions F. Compare types of equipment, operation and service G. Field operation of equipment	A. Student program B. Quiz C. Grade student demonstration Grade student performance Grade student performance
A. Lecture B. Organized class discussion C. Demonstration D. Resource person	A. Notes B. Prepare written report C. Visit location or place monitoring or trap device for class observation.	A. Quiz B. Reports

MODULE OF INSTRUCTION

Title - Controlling Apple Insects Code - 01.01020105-03

RESOURCE MATERIALS

Books:

Modern Fruit Science, Norman Childers	Horticultural Publ.
Approved Practices in Fruit Production,	Scheer & Juergensen
Insects Identification Manual	California State Polytechnic
Insects	The Yearbook of Agriculture 1952

Bulletins:

Cultural Practices in the Bearing Orchard		CU 1212
Insects and Diseases of Stone Fruit Trees		CU 1113
Petroleum Oils for the Control of Orchard Pest	Geneva	814
Apple Maggot Control	Research Circular	5
Apple Maggot Fly Emergence	Geneva	789
Red-banded Leaf Roller and Its Control	Geneva	755
Pesticides and You	Chemicals-Pesticides	6
Pesticide Register	Geneva	
Power Sprayers and Dusters	USDA	2223
Tree Fruit Recommendations	N.Y.S. College of Agriculture	

A great deal of trade material is available from manufacturer

Film: First aid - poisons
Trade Films

MODULE OF INSTRUCTION

Title - HARVEST, MARKETING, AND STORAGE OF THE APPLE CROP

Code - 01.01020105-04

DESCRIPTION:

New York State apples are available during most of the year because of effective harvesting, storing, and marketing methods. This module is designed to consider both the technical and skill aspects of these factors. The student will examine the industry and production cost factors.

The student will be able to determine apple maturity and evaluate methods of harvest. Methods of storage will be compared and grading standards discussed with consideration given to marketing channels. The student will be able to identify the primary problems of the apple industry and pose solutions.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Understanding the Apple Industry	4	2
2. Apple Harvest	2	4
3. Apple Storage	2	4
4. Apple Marketing and Grading	4	4
5. Identification of Industry Problems and Consideration of Solutions	2	2
	14	16

Revised March 1975

MODULE OF INSTRUCTION

Title - Harvest, Marketing and Storage of the Apple Crop

Code - 01.01020105-04

OBJECTIVES to be obtained: The student will be able to:

1. Collect economic data materials: prices, production cost, etc., and interpret the factors which have resulted in the local, state, and national apple markets.
2. Outline both the process and fresh fruit marketing channels available to the producer.
3. Harvest fresh market and process apples and demonstrate an understanding of the principles of mechanical apple harvest.
4. Compare methods of apple storage and make a selection based on local business factors.
5. Investigate institutions which affect the marketing of the apple crop and evaluate the role played by each.
6. Restate apple grading standards and grade a standard sample to U.S.D.A. specifications.
7. Analyze the problems facing the apple industry and pose researched solutions.

Code - 01.01020105-04

Title - Harvest, Marketing and Storage of the Apple Crop

OBJECTIVES BY UNIT	**CONTENT**
Unit 1 - UNDERSTANDING THE APPLE INDUSTRY Objective 1 Collect economic data materials: prices, production cost, etc. and to interpret the factors which have resulted in the local, state, and national apple market	A. Apple production regions B. Product characteristics C. Production and consumption data . Local . State . National D. Basic economics
Objective 2 Outline both the process and fresh fruit marketing channels available to the producer	A. The apple market . Fresh . direct . wholesale . Process . contract . open market B. Cooperative C. Agencies . Commission houses . Brokers . Jobbers
Unit 2 - APPLE HARVEST Objective 3 Harvest fresh market and process apples and demonstrate an understanding of the principles of mechanical apple harvest	A. Time of apple harvest . Flesh firmness . Ground color . Ease of separation . Lays in full bloom . Calendar date . Sugar content B. Methods of apple harvest . Hand . preparation . equipment . containers . labor . procedure . Mechanical C. Crop handling

E D U C A T I O N 01.01020105-04 - Code

Harvest, Marketing and Storage of the Apple Crop - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture outline B. Supervised study C. Resource person C. Field trip	A. Survey local fruit industry B. Prepare exhibit to show characteristics of the apple and the apple industry	A. Oral or written test on prices
A. Lecture outline B. Field trips C. Resource people D. Marketing representative	A. Outline local marketing channels B. Develop a plan to market apples given a local situation C. Class reports	A. Oral or written test on fresh markets. B. Teacher evaluation of plan and report evaluation
A. Lecture outline B. Demonstration C. Field trips D. Resource person	A. Students check orchard using various methods of determining ripeness B. Pickup drops for fund raising activity C. Harvest apples in orchard	A. Check each student's harvest - sample B. Oral or written test on the principles of mechanical harvest.
E. Field trial or demonstration F. Panel discussion: hand vs. mechanical harvest G. Demonstration	D. Review trade material E. Compare damage with various handling procedures	C. Class presentation

Code - 01.01020105-04

Title - Harvest, Marketing and Storage of the Apple Crop

OBJECTIVES BY UNIT	**CONTENT**
Unit 3 - APPLE STORAGE Objective 4 Compare methods of apple storage and make a selection based on local business factors	A. Types of apple storage . Common . Refrigerated . Controlled atmosphere . freezer B. Factors affecting storage life . Climate . Orchard management . Variety . Size . Maturity . Handling . Temperature . Market C. Storage problems . Temperature . Disease . Rodent
Unit 4 - APPLE MARKETING AND GRADING Objective 5 Investigate institutions which affect the marketing of the apple crop and be able to evaluate the role played by each.	A. Market outlets . Individuals - open market . Contracts . Cooperative B. **Marketing orders** C. **Market controls**
Objective 6 Restate apple grading standards and grade a standard sample to USDA specifications.	A. Apple grade standards B. Mechanical grading C. Hand grading

EDUCATION

01.01020105-04 - Code
Harvest, Marketing and Storage
of the Apple Crop - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture outline B. Field trips C. Ditto handout	A. Fill in comparison chart B. Visit at least two types of storage	A. Oral quiz B. Collect charts
D. Outline factors affecting storage life--allow students to research areas. E. Supervised study F. Resource person	C. Compile factor - affect chart D. Oral report to class	C. Grade report
A. Lecture outline B. Resource person C. Field trip D. Prepared mounts and specimens E. Lecture outline F. Field trip G. Resource person	A. Review mounts and specimen samples B. Have students market an apple crop as a managerial exercise C. Have students record daily apple market prices	A. Identification quiz B. Report grade
A. Lecture B. Demonstration C. Field trip D. Ditto handout E. Prepared mounts	A. Students will grade field samples of apple-crop using grade standards and sizing rings B. Students will observe mechanical grader in operation	A. Quiz on grade standards each grade one bushel

Code - 01.01020105-04

Title - Harvest, Marketing and Storage of the Apple Crop

OBJECTIVES BY UNIT	CONTENT
Unit 5 - IDENTIFICATION OF INDUSTRY PROBLEMS AND CONSIDERATION OF SOLUTIONS Objective 7 Analyze the problems facing the apple industry and be able to pose researched solutions	A. Primary apple industry problems . Efficiency . Production . Labor . Market . Education

01.01020105-04 - Code

Harvest, Marketing and Storage of the - Title
Apple Crop

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture outline of managerial decision B. Resource person and interviews	A. Develop managerial plan B. Present panel discussion to social studies class or local service club C. Have students examine new market channels	A. Each student will present the topic individually or as part of a group Grade managerial plan

MODULE OF INSTRUCTION

Title - Harvest, Marketing and Storage of the Apple Crop
Code - 01.01020105-04

RESOURCE MATERIALS

Books:

Modern Fruit Science, Norman Childers Horticultural Publ.
Approved Practices in Fruit Production Sheer and Juergensen Interstate
Apple Planting Systems R.L. Norton Extension Specialist

Bulletins:

Tree Fruit Recommendations N.Y.S. College of Agriculture

Cultural Practices of the Bearing Orchard	CU 1212
Apple Varieties of New York State	CU 1174
The Storage of Apples	CU 440
Controlled Atmosphere Storage of Apples	CU 759
Harvesting, Handling and Packing Apples	CU 750
Apple Grade Standards	USDA

Directions for Judging Apples Cornell Dept. of Pomology

GRADES

U.S. Extra Fancy consists of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3), clean (4), well formed (5), free from decay, internal browning, internal breakdown, scald, scab, bitter pit, Jonathan spot, freezing injury, broken skins, and bruises (except those that are slight and incident to proper handling and packing), and visible water core. The apples shall also be free from injury (6) caused by russeting (6a) sunburn or spray burn (6b) limb rubs (6c) hail (6d), drought spots (6d) scars (6d) stem or calyx cracks (6e) other diseases (6f) insects (6g) or mechanical or other means (6). Each apple of this grade shall have the amount of color specified hereinafter for the variety. (see Color Requirements, Tolerances and Condition after Storage and/or Transit.)

U.S. Fancy consists of apples of one variety which are mature (1) but not overripe (2), carefully handpicked (3) clean (4), fairly well formed (7) free from decay, internal browning, internal breakdown, bitter pit, Jonathan spot, scald, freezing injury, broken skins and bruises (except those incident to proper handling and packing), and visible water core. The apples shall also be free from damage (8) scars (8d) stem or calyx cracks (8e) other diseases (8f) insects (8g) or mechanical or other means (8). Each apple of this grade shall have the amount of color specified hereinafter for the variety. (see Color Requirements, Tolerances and Condition after Storage or Transit.)

U.S. No. 1 The requirements for this grade are the same as U.S. Fancy except for the color and russeting. In this grade less color is required for all varieties except yellow and green varieties, for which the requirements for both grades are the same. Apples of this grade shall be free from excessive damage caused by russeting which means that they shall meet the russeting requirements for U.S. Fancy as defined under the definitions of "damage by russeting" (8a) provided, that, the aggregate area of an apple which may be covered by net-like russeting shall not exceed 25 per cent, and further provided, that the aggregate area of an apple which may be covered by smooth solid russeting shall not exceed 10 per cent. (see Color Requirements, Tolerances and Condition after Storage or Transit.)

U.S. No. 1 Cookers consists of apples of one variety which meet the requirements of U.S. No. 1 grade except as to color. This grade is provided for apples which are mature but which may not have sufficient color or meet the specifications of U.S. No. 1 (see Tolerances and Condition after Storage or Transit.)

1. Numbers and letters in parentheses following grade terms indicate where such terms are defined under Definitions.

U.S. Utility consists of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3) not seriously deformed, (9) free from decay, internal browning, internal breakdown, scald and freezing injury. The apples shall also be free from serious damage (10) caused by dirt or other foreign matter, broken skins, bruises, russeting (10a) sunburn (10b) spray burn (10b) limb rubs (10c) hail (10d) drought spots (10d) scars (10d) stem or calyx cracks (10e) visible water core (10f) other diseases (10g) insects (10h) or mechanical or other means (10). (see Tolerances and Condition after Storage or Transit.)

U.S. Hail Grade consists of apples which meet the requirements of U.S. No. 1 grade except that hail marks where the skin has not been broken and well healed hail marks where the skin has been broken shall be permitted, provided the apples are fairly well formed. (see Color Requirements, Tolerances and Condition after Storage or Transit.)

New York State College of Agriculture M-252

Department of Pomology

DIRECTIONS FOR JUDGING PLATES OF APPLES

1. Score Card: The type of score card used, the points considered and their relative importance varies in different exhibits or contests. The score card considered here is used by the New York State Horticultural Society and considers the following points and values.

Form - - - - - - - - -	15
Size - - - - - - - - -	15
Color - - - - - - - -	25
Condition or Maturity	15
Freedom from Blemish	30
	100

2. Interpretation of terms:

(1) Form: The shape and conformation of apples on any one plate should be typical for the variety, the region of growth being considered somewhat. All speciments on a plate should be uniform in shape. When competition is close, a careful comparison of the more minute characteristics of the basin, cavity and stem are made when considering uniformity.

(2) Size: The specimens on any one plate should be uniform in size and of the size that is most acceptable on the market for the variety. A plate should be scored down if the specimens are either under or over the accepted commercial size.

(3) Color: All specimens on the plate should be uniformly colored in the way that is considered ideal for the variety in the district grown. In judging color consider: (a) the attractiveness of the ground color, (b) the brightness and attractiveness of the over-color, (c) the amount of over-color. In a yellow or green apple the yellow or green color should be clear and even all over, not dull or muddy. In varieties that are typically blushed, (e.g. Maiden Blush) the specimens should show a distinct tinge of red on the cheak exposed to the sun. With apples like the Rhode Island Greening that are only sometimes blushed the apples on a given plate should be either uniformly blushed or uniformly green. In western New York preference is given to green Rhode Island Greenings over the blushed type provided the plates in question are equally good otherwise.

With apples typically with a red over-color, an intense color for the variety is desirable. In general, the more color the better the plate, provided the color is typical. Apples may be polished, but in no case should polished specimens be given the preference.

Under this heading is included the somewhat indefinite characteristic known as "finish." This refers to the brightness and clearness of the over-color and ground color and the smoothness of the skin. Finish is particularly important in green varieties like Rhode Island Greening. The finish may be bright and attractive or "muddy" though the actual shade of green may be the same.

(4) Condition or Maturity: This refers to the degree of ripeness. An apple to be in excellent condition should be mature, but firm for the variety. It should be free from withering that comes when apples are picked too green or have not been stored properly. The fruit should not be overripe so as to be mealy or show physiological breakdown.

(5) Freedom from Blemish: Specimens should be free from blemishes of all sorts. The judges should look particularly for (a) marks of fungus or physiological disease, including stippin and watercore; (b) injury from insects of all kinds, (c) mechanical injury, including loss of stem. Unmistakable evidence of codling moth injury or San Jose Scale may disqualify a plate. Other blemishes are considered important in about the following order: side worms, scab, other fungous blemishes, stippin, curculio or red bug, skin punctures, bruises, stem broken or out, russet (not typical for variety) and limb rub. The extent of scab spots should be considered. Minute spots are not as serious as some other blemishes, whereas spots which would throw the apple out of fancy grade should disqualify the plate.

Attention is called to the fact that on this score card uniformity is not considered as a separate heading but that it is scored under each of the headings, form, size, and color. Some score cards give uniformity as a separate heading, but this is not considered advisable, because such a practice usually results in a double cut for uniformity.

3. Other Information: Five specimens constitute a plate for judging, and either four or six specimens disqualify a plate in a contest.

Caution: Avoid pressing the specimens with the thumb and finger so as not to bruise the fruit. The degree of firmness can be determined by gentle pressure with the inside of the whole hand.

Defects, apparent or otherwise should not be probed with finger nail or other hard object. This disfigures the fruit and makes the contest unfair for those who judge the fruit later.

Special care should be used to replace all specimens on the right plate.

Be prepared if necessary to defend your judgment in the placing of the plates.

If the variety is incorrectly named the plate is disqualified and if possible the correct name indicated on the plate card. If a synonym is used the plate is judged and the accepted name indicated.

SCORE CARD FOR PLATES OF APPLES

M-137

Student's Name . . . . Date . . . .

Variety . . . .

		Plate I		Plate II	
	Perfect Score	Score	Reasons	Score	Reasons
Form	15				
Size	15				
Color	25				
Freedom from Blemish	30				
Condition	15				
Total	100				

Total Score ____________________ Total Score ____________________

		Plate III		Plate IV	
	Perfect Score	Score	Reasons	Score	Reasons
Form	15				
Size	15				
Color	25				
Freedom from Blemish	30				
Condition	15				
Total	100				

472

Placing 1st ______________ 2nd ______________ 3rd ______________ 4th ______________

METHODS OF STORING APPLES

	CONTROLLED ATMOSPHERE	REFRIGERATED	COMMON or AIR COOLED
Discription			
Cost			
Advantages			
Disadvantages			
Principles of Operation			

MODULE OF INSTRUCTION

Title - Producing Vegetable Crops for Processing

Code - 01.01020107-01

DESCRIPTION:

The costs and returns of producing vegetable crops for processing will be reviewed by students enrolled in this module as they develop skills in the selection of vegetable varieties in demand by vegetable processors. Cultural practices for the production of high quality vegetables will be discussed.

Processor contracts, quality of vegetables to be harvested, and types of equipment needed to economically produce processing vegetables are areas in which students will work.

Special services such as grading and packing the raw vegetable products will be performed by students.

Divisions or Units of Content	Time Allocation	
	Class	Other
1. The Costs of and Returns on Vegetable Crops Raised for Processing	3	4
2. Negotiating Contracts with Vegetable Processors	2	5
3. Cultural Practices for Vegetable Production	4	2
4. Harvesting and Packing Techniques for Processing Vegetables	2	8
	11	19

MODULE OF INSTRUCTION

Title - Producing Vegetable Crops for Processing

Code - 01.01020107-01

OBJECTIVES to be obtained:

The student will be able to:

1. Determine the feasibility of establishing a vegetable enterprise for a processing market.

2. Select 8 vegetable crops which can be grown for processing in a specific region. Determine the factors to consider for producing each crop selected.

3. Determine the costs involved in producing a specific vegetable crop.

4. Research a list of prices received by producers over the past 5 years for each crop listed in objective 2. Present the information in graph form.

5. Determine which of the vegetable crops selected would be the most profitable in a given region. Rank each in order of the amount of highest economical returns.

6. Determine 4 factors used in negotiating a growing contract with processors.

7. List 10 items which need to be considered in developing a bonified written contract.

8. Develop a growing and marketing contract for a specific vegetable crop.

9. Demonstrate acceptable techniques for the operation of equipment needed to fit soil, plant and produce vegetable crops.

10. Identify 2 acceptable means of weed control for each vegetable listed in objective 2.

11. List 2 insecticides which are permissable for use on each crop listed in objective 2.

12. **Identify 6 pests which can attack each vegetable listed in objective 2.**

13. Determine if irrigation will be needed for the production of crops selected in objective 2.

14. List market grades used to evaluate each crop listed in objective 2.

15. Compare the cost of mechanical harvesting and hand labor for each crop listed in objective 2.

MODULE OF INSTRUCTION

Title - Producing Vegetable Crops for Processing Code - 01.01020107-01

OBJECTIVES to be obtained: Cont.

16. Demonstrate the ability to operate in a live situation at least one mechanical harvester for a specific vegetable crop produced in your region.

17. Determine the optimum time to harvest vegetable crops that will insure a high quality package after the vegetable is processed.

18. Determine the techniques used by the farmer to handle vegetable crops in preparing for and transporting them to the processor.

Code - 01.01020107-01

Title - Producing Vegetable Crops for Processing

OBJECTIVES BY UNIT	CONTENT
Unit 1 - The costs of and returns on vegetable crops raised for processing Objective 1 Determine the feasibility of establishing a vegetable enterprise for a processing market.	A. Factors affecting production . Soil . type . drainage . fertility . Climate . Topography B. Labor . Availability . Cost C. Markets . Locations . distance
Objective 2 Select 8 vegetable crops which can be grown for processing in a specific region. Determine the factors to consider for producing each crop selected.	A. Equipment . Soil preparation . Planting . Harvesting B. Fertilizers . Amounts needed (from test) . Cost . Methods of applications C. Herbicides . Cost . Applicability D. Pesticides . Costs . Applicability E. Labor . Availability . Adaptability to the crop . Cost F. Custom work

01.01020107-01 - Code

Producing Vegetable Crops for Processing - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/discussion B. Supervised study on land use capability maps C. Field trip to land laboratory and commercial growers D. Guest speakers from Soil Conservation Service, Cooperative Extension, Personnel from processing plants. E. Demonstrate how to **secure soil samples, test samples, and determine fertilizer requirements.**	A. Take notes on lecture and class discussions. B. Secure land use capability map of the geographic area of particular interest. C. Test soil for fertility and pH.	A. Teacher evaluation of student notebook. B. Teacher evaluation of students ability to test soil. C. Performance grade on soil testing techniques. D. Lab quiz on unknown soil samples.
A. Class discussion of the factors involved. B. Supervised study of crops which are adaptable to New York State, and to the geographical locations selected.	A. Participate in class discussion. B. Compile notes for the notebook. C. Prepare a list of crops which can be grown in the designated region.	A. Oral or written test on factors to consider when selecting a vegetable to raise for processing. B. Teacher evaluation of the crops selected.

Code - 01.01020107-01

Title - Producing Vegetable Crops for Processing

OBJECTIVES BY UNIT	CONTENT
Objective 3 Determine the costs involved in producing a specific vegetable crop.	A. Equipment .Depreciation .Operation B. Fertilizer .Season purchased .in season cost - high .off season cost - lower C. Herbicides .Cost of product .Cost of application D. Pesticides .Cost of product .Cost of application E. Labor .Wages .Insurance .Social security .Housing .Union activities F. Custom Work
Objective 4 Research a list of prices received by producers over the past 5 years for each vegetable listed in objective 2. Prepare the information in graph form.	A. Market Prices .Income for vegetable crops .Prices received for each type of crop over the past 5 years
Objective 5 Determine which of the vegetable crops selected would be the most profitable in a given region. Rank each crop in order of the highest economical return.	A. Cost of producing .Machinery .Labor .Seed .Fertilizer .Herbicides .Insecticides .Transportation B. Income Factors .Prices received .quality C. Profit .Net profit .income .expenses

EDUCATION

01.01020107-01 - Code

Producing Vegetable Crops for Processing - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Supervised study of costs related to each factor C. Group activity researching factors. Select a group leader. D. Allow each group to report its results to the class. E. Have Extension Service specialists report on cost items of specific crops.	A. Compile notes for the notebook. B. Actively research cost factors assigned to a particular group. C. Prepare the item researched for presentation to the total class.	A. Teacher evaluation of material researched and that filed in student's notebooks. B. Oral or written test on cost factors.
A. Supervised study B. Class discussion C. Guest speaker from a vegetable processing plant - topic prices paid. D. Analysis of crop reporting service data agriculture and markets. E. Group activity - set up group for each crop, select a group leader.	A. Present a report as an outgrowth of research, prices received for specific crops. B. Compile information in the notebook. C. Prepare a graph showing the fluctuation of prices, seasonally and annually.	A. Teacher evaluation of prepared information and the graph. B. Essay question on prices of vegetable crops. C. Oral quiz on prices of vegetable crops.
A. Supervised study B. Class discussion C. Teacher prepare mimeo materials D. Guest speaker from a processing vegetable farm - topic cost of producing and return.	A. Participate in class discussion B. Question the speaker C. Compile information in the notebook.	A. Oral or written test on cost, income, and profit calculation. B. Teacher evaluation of prepared information in notebook.

Code - 01.01020107-01

Title - Producing Vegetable Crops for Processing

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Negotiating contracts with vegetable processors Objective 6 Determine 4 factors used in negotiating a growing contract with processors.	A. Needs of the processor B. Needs of the grower C. Needs of the consumer D. Legality of contract E. Individuals involved
Objective 7 List 10 items which need to be considered in developing a bonified written contract.	A. Names of producer and buyer .Dates of contract .Terms of contract B. Producer .Variety of vegetable .Time of planting .Quality .Grade C. Processor .Grades .Amount contracted .Open market .Prices
Objective 8 Develop a growing and marketing contract for a specific vegetable crop.	A. Amounts to be delivered B. Date of delivery C. Transportation D. Quality of product E. Price
Unit 3 - Cultural practices for vegetable production Objective 9 Demonstrate techniques needed to operate equipment used to fit soil, plant, and produce vegetable crops.	A. Safety and operation .Tillage equipment .Planting equipment .Spraying equipment .Dusting equipment

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Field trip to processing plant C. Guest speaker - contractor from processing plant	A. Participate in class discussion B. Participate in field trip C. Compile notes	A. Oral or written test on factors and reasoning for the development of contracts. B. Field trip report grade
A. Class discussion B. Panel discussion C. Supervised study	A. Participate in class discussion B. Prepare for panel discussion C. Compile notes	A. Teacher evaluation of students notebook B. Students prepare a written contract for a specific commodity.
A. Supervised study B. Class discussion of the contract	A. Prepare the contract	A. Teacher evaluation of the prepared contract. B. Students prepare a written contract for a specific commodity.
A. Lecture/discussion B. Demonstration of equipment C. Field trip to observe equipment being operated D. Supervised practice	A. Participate in class discussion B. Observe demonstration C. Participate in field trip D. Operate equipment	A. Teacher evaluation of student's ability to operate equipment used in vegetable production. B. Quiz on safety procedures.

Code - 01.01020107-01

Title - Producing Vegetable Crops for Processing

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Objective 10 Identify 2 acceptable means of weed control for each vegetable listed in objective 2.	A. Chemical .Certification requirements .Equipment .Availability .Cost B. Mechanical .Equipment .Labor .Cost
Objective 11 List 2 insecticides which are permissable to be used on each vegetable listed in objective 2.	A. Insecticides affect on .Chewing .Sucking .Contact B. Collection of insects
Objective 12 Identify 6 pests which can attack each of the vegetables listed in objective 2.	A. Families B. Classification C. Categorization according to crop attacked
Objective 13 Determine if irrigation will be needed for vegetable crop growth when considering each crop listed in objective 2.	A. Average yearly rainfall B. Rainfall required for the crop C. Irrigation .Costs .Types of systems .pump .gravity
Unit 4 - Harvesting and packing techniques for processing vegetables. Objective 14 List the quality evaluations used in selecting and grading the vegetables listed in objective 2.	A. State grades B. Federal grades

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Class discussion C. Invite a grower and Extension Service to discuss chemical and mechanical weed control for specific crops in the region.	A. Participate in class discussion. B. Compile notes C. List methods of weed control.	A. Teacher evaluation of student list of acceptable means of weed control.
A. Supervised study B. Insect collection and laboratory demonstration and practice.	A. Compile notes B. **Collect insects** C. **Recommend insecticide to use in controlling insects.**	A. **Oral or written test** on types of, and effects of, insecticides on the vegetables selected.
A. Supervised study B. Demonstration of identifying pests C. Supervised practice	A. Compile notes B. Observe demonstration C. Categorize crop with pests	A. Teacher evaluation of student identification of pests.
A. Supervised study B. Field trip to farm using irrigation	A. Compile notes B. Research **industry magazines .Cut out pictures of different types of irrigation systems.**	A. Teacher evaluation of student's reasoning for selecting or rejecting irrigation.
A. Supervised study market grades B. Field trip to vegetable processing plant C. Invite field personnel from processing plant to school, discuss producing quality vegetables, grading standards and maintaining quality from farm to plant.	A. Compile notes B. Participate in the field trip.	A. Oral or written test listing the quality **grades used** for 6 specific vegetables.

OBJECTIVES BY UNIT	CONTENT
Objective 15 Compare the cost of mechanical harvesting and hand labor for each crop listed in objective 2.	A. Farmer owned equipment B. Custom work
Objective 16 Demonstrate the ability to operate in a live situation at least one mechanical harvester for a specific vegetable crop produced in your region.	A. Safety B. Alertness C. Efficiency D. Maintenance of equipment E. Servicing of equipment
Objective 17 Determine the optimum time to harvest vegetable crops that will insure a high quality package after the vegetable is processed.	A. Quality indicated in the contract B. Estimation of maturity C. Using tenderometer
Objective 18 Determine the techniques used by the farmer to handle vegetable crops in preparing for and transporting them to the processor.	A. Immediate delivery B. Refrigeration C. Care in handling

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Class discussion	A. Compile notes	A. Teacher evaluation of the written comparison.
A. Class discussion B. Teacher demonstration C. Supervised practice	A. Participate in class discussion. B. Observe demonstrations C. Practice operating the machine.	A. Teacher evaluation of student progress in learning to operate the harvesting equipment. B. Oral or written test
A. Guest speaker from processing company B. Field trip to field to observe crop ready to be harvested.	A. Compile notes B. Participate in field trip	A. Teacher evaluations of student ability to determine the optimum time to harvest.
A. Field trip B. Class discussion	A. Compile notes B. Participate in field trip C. Prepare a report on how to handle crops for presentation of quality.	A. Oral or written test on methods of handling crops for the least damage in handling and transport.

MODULE OF INSTRUCTION

Title - Producing Vegetable Crops for Processing   Code - 01.01020107-01

RESOURCE MATERIALS:

A. **Periodicals**

Cropping Up

Cooperative Extension mailings

I.M.S. Rm. 19, Stone Hall, Cornell University, Ithaca, New York 14853

Film Strips

F202	Soil Structure
F203	Soil Color
F204	Soil Texture
F206	Collecting and Preparing Soil Samples
F207	Soil Acidity and Testing pH
F201S	Soil and Its Properties
F201M	Fertilizer Elements
F303	Weed Control - Cultural and Chemical
F301S	Weeds

B. **Bulletins**

Common Insects G903
Common Insects of Vegetables C.E.B. 1035
Vegetable Diseases C.E.B. 1034
Field Crops Cost and Returns Ag Econ. Res. Yearly
Cost and Returns on Snap Beans Production, Ag Econ. Res. Yearly
Cornell Recommends for Veg. Crops, yearly
Farm Management Handbook, Ag Econ. Ext. 440 (yearly)

Books

Snowden & Donahoo
Profitable Farm Marketing, Prentice Hall, Englewood Cliff, N.Y.

Ware McCallum.
Producing Vegetable Crops, 2nd edition,
The Interstate Printers and Publishers, Inc., Danville, Ill.

C. Processing Plant Personnel .Gerbers Baby Foods .Curtis Burns
.Beechnut Baby Foods .Profac

MODULE OF INSTRUCTION

Title - Anesthesia and Euthanasia

Code - 01.0101010704-05

DESCRIPTION:

The student will learn to assist a veterinarian or doctor give anesthesia to an animal. The student will learn how to hold an animal in a state of anesthesia while assisting a veterinarian. The anesthesia methods will include not only the topical and inhalation system but also the injectable methods.

The student will learn the humane methods of killing an animal at the directions of the veterinarian. The methods of euthanasia include both the physical techniques such as cervical fractures and the chemical methods including both the overdose of anesthesia and use of approved gases.

Emphasis will be placed on the importance of the proper use of the methods being taught and that they should be used under the supervision of a veterinanrian or supervisor.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Factors Governing Choice of Anesthetic	1	2
2. Mode of Administration	0	10
3. Stages of General Anesthesia	0	7
4. Euthanasia	1	9
	2	28

MODULE OF INSTRUCTION

Title - Anesthesia and Euthanasia

Code - 01.0101010704-05

OBJECTIVES to be obtained:

The student will be able to:

1. Administer local or general anesthesia under the directions of a veterinarian or supervisor.
2. Hold an animal in the state of anesthesia under the guidance of a veterinarian or supervisor.
3. Use inhalation and injection methods of administering anesthesia.
4. Terminate an animal using the humane methods and physical techniques of cervical fractures and the chemical methods such as overdoses of anesthesia or use of approved gases.

Code - 01.0101010704-05

Title - Anesthesia and Euthanasia

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Factors Governing Choice of Anesthetic Objective 1 Administer local or general anesthesia under the directions of a veterinarian or supervisor.	A. Species of animal B. Surgical site C. Duration of anesthesia D. Post-operative fate E. Health of animals
Unit 2 - Mode of Administration Objective 2 Hold an animal in the state of anesthesia under the guidance of a veterinarian or supervisor.	A. Topical B. Inhalation . Chamber system . Open system . Closed system C. Injection . Subcutenous . Intravenous . Spinal D. Duration . Short term . Long term
Unit 3 - Stages of General Anesthesia Objective 3 Use inhalation and injection methods of administering anesthesia	A. Analgesia B. Excitement C. Surgical anesthesia D. Asphyxia

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture/Discussion B. Demonstration of anesthesia equipment	A. Compile notes B. Participate in discussion C. Prepare a list of procedures to follow D. Practice demonstrated procedure	A. Teachers evaluation of students list of procedures in administering anesthesia.
A. Field trip to operating room to observe demonstration. B. Supervised practice	A. Participate in field trip B. Compile notes on each mode of administration and use of each. C. Practice (if possible) the demonstrated techniques.	A. Oral or written test on methods of administration. B. Teachers evaluation of students success at holding the anesthetized animal.
A. Class discussion B. Demonstrations on various stages of anesthesia	A. Participate in class discussion B. Observe demonstration C. Practice the demonstrated techniques	A. Teacher's evaluation of students ability to use both inhalation and injecting methods of anesthesia.

Code - 01.0101010704-05

Title - Anesthesia and Euthanasia

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Euthanasia Objective 4 Terminate an animal using the humane methods and physical techniques of cervical fractures and the chemical methods such as overdoses of anesthesia or use of approved gases.	A. Physical . Cervical fracture . Captive bolt pistol . Heart rupture . Vacuum B. Chemical . Injectable agents . Barbiturates . Magnesium sulfate . Inhalable agents . ether, chloroform . carbon dioxide . carbon monoxide

Anesthesia and Euthanasia Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study	A. Compile notes	A. Oral or written test on physical and chemical methods of euthanasia.
B. Demonstration	B. Observe demonstration	
C. Field trip	C. Participate in field trip	
D. Supervised practice	D. Practice demonstrated techniques	

MODULE OF INSTRUCTION

Title - Anesthesia and Euthansia

Code - 01.0101010704-05

RESOURCE MATERIALS

Books:

The I.A.T. Manual of Laboratory Animal Practice and Techniques
D. J. Short and Dorothy P. Woodnott
Charles C. Thomas
Springfield, Illinois

Experimental Animal Anesthesiology
U.S.A.F.
Brooks Air Force Base, Texas

An Introduction to the Anesthesia of Laboratory Animals
UFAW
London, England

Films:

Equine Anesthesia
Abbott Universal
Chicago, Illinois

Fire and Explosion Hazards from Flammable Anesthesia
Abbott Universal
Chicago, Illinois

Epidural Anesthesia in the Hog
American Veterinary Medical Association
Chicago, Illinois

MODULE OF INSTRUCTION

Title - LABORATORY TECHNIQUES-SMALL ANIMALS Code - 01.0101010704-06

DESCRIPTION:

The student will learn to obtain blood from small animals from both capillaries and veins. The veins from which the student will learn to draw blood include tail veins of rats and mice, the obital venous plexes of rats and mice, as well as ear (marginal) veins of rabbits and leg and jugular veins of other small animals such as cats and dogs. The student will also learn to draw both capillary and venous blood from birds.

The student will learn to inject animals including, intravenous, intraperitoneal, intradermal, as well as intramuscular and subcutaneous. Other methods of injecting such as intranasal, intraocular and percutaneous will be included. In order to give proper injections the student will learn to calculate weights and measurements along with learning to convert temperature scales.

The student will learn to handle new, unhandled animals and learn to use normal animal responses to train small animals such as birds and rats.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Obtaining Blood Specimens from Small Animals	1	11
2. Injecting Animals	1	9
3. Calculations used in Animal Care	1	2
4. Conditioning Small Animals	0	5
	3	27

Revised August '75

MODULE OF INSTRUCTION

Title - LABORATORY TECHNIQUES-SMALL ANIMALS

Code - 01.0101010704-06

OBJECTIVES to be obtained:

The student will be able to:

1. Obtain capillary blood from the tail of rats and mice.
2. Obtain capillary blood from rabbits, birds and other small animals.
3. Obtain venous blood from both the tail and obital venous plexes of rats and mice.
4. Obtain venous blood from rabbits, birds, cats and dogs, and other small animals.
5. Obtain heart blood from birds and small mammals.
6. Inject animals orally or by stomach tube.
7. Administer subcutaneous injections to small animals.
8. Administer intravenous injections to small animals.
9. Administer intraperitoneal injections to small animals.
10. Administer intradermal, intramuscular and intracerbral injections to small animals.
11. Administer intranasal, intraocular or percutaneous injections to small animals.
12. Calculate the different weights and measurements used in animal care.
13. Convert temperature scale readings from centigrade to Fahrenheit and Fahrenheit to centigrade.
14. Handle new previously unhandled animals.
15. Use normal animals responses to train small animals such as birds and rats.

Code - 01.0101010704-06

Title - LABORATORY TECHNIQUES-SMALL ANIMALS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Obtaining Blood Specimens from Small Animals Objective 1 Obtain capillary blood from the tail of rats and mice	A. Capillary Bleeding . Rats . Mice
Objective 2 Obtain capillary blood from rabbits, birds and other small animals	A. Capillary Bleeding . Rabbits . Birds . Small animals
Objective 3 Obtain venous blood from both the tail and obital venous plexes of rats and mice	A. Obtaining venous blood from: . Rats . Mice . tail veins . orbital venous plexus
Objective 4 Venous blood from rabbits, birds, cats, dogs and other small animals	A. Obtaining venous blood from: . Rabbits . ear veins . Primates . Avian species . Cats . Dogs . Other animals

01.0101010704-06 - Code

EDUCATION

LABORATORY TECHNIQUES-SMALL ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Demonstrations C. Movies and film strips D. Laboratory exercises	A. Classroom and laboratory notes B. Laboratory exercises in obtaining capillary blood from rats and mice	A. Laboratory exercise grade B. Performance on laboratory techniques and obtaining blood C. Oral grade on laboratory procedures
A. Demonstrations B. Laboratory exercises C. Film strips	A. Complete laboratory exercises B. Notes on demonstrations and laboratory exercises	A. Performance grade on laboratory exercises obtaining capillary blood
A. Supervised study B. Classroom discussion C. Demonstrations D. Laboratory exercises E. Film strips	A. Laboratory exercises in bleeding small animals obtaining venous blood B. Classroom demonstrations and laboratory notes	A. Written test B. Laboratory exercise test. Performance grade
A. Supervised study B. Classroom discussion C. Demonstrations D. Laboratory exercises E. Film strips	A. Laboratory exercises in bleeding small animals obtaining venous blood B. Classroom demonstrations and laboratory notes	A. Written test B. Laboratory exercise test. Performance grade

Code - 01.0101010704-06

Title - LABORATORY TECHNIQUES-SMALL ANIMALS

OBJECTIVES BY UNIT	CONTENT
Objective 5 Obtain heart blood from birds and small animals	A. Obtaining heart blood . Rats and mice . Guinea pigs . Rabbits . Birds . Other animals B. Locate and identify the pericardium heart chambers and valves, major arteries and veins in preserved dissection specimen C. Anatomy of the heart . Chambers . Valves . Blood flow patterns
Unit 2 - Injecting Animals Objective 6 Inject animals orally or by stomach tube	A. Internal injections . Orally . Stomach catheter
Objective 7 Administer subcutaneous injections to small animals	A. Parenternal injections B. Subcutaneous injections

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Demonstrations C. Laboratory exercises D. Film strips and movies E. Field trip to state or private small animal laboratory F. Invite veterinarian to class as a resource person to lecture and demonstrate obtaining heart blood	A. Laboratory exercises in locating and identifying the pericardium, heart chambers and valves, master arteries and veins. B. Obtain heart blood samples from laboratory specimens. C. Notes on supervised study, demonstrations, guest speakers and laboratory work.	A. Written test B. Oral test C. Performance grade on laboratory work D. Notebook grade
A. Demonstrations B. Film strips C. Laboratory exercises	A. Administer oral and stomach internal injections using small animals in the schools laboratory	A. Performance test B. Oral test
A. Demonstrations B. Laboratory exercises	A. Administer subcutaneous injections in small animals	A. Performance test--laboratory procedures, techniques and methods

Code - 01.0101010704-06

Title - LABORATORY TECHNIQUES-SMALL ANIMALS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Objective 8 Administer intravenous injections	A. Intravenous injections . Rats . Mice . Rabbits . Birds
Objective 9 Administer intraperitoneal injections to small animals	A. Intraperitoneal injections . Rats . Mice
Objective 10 Administer intradermal injections to small animals	A. Intradermal injections B. Intramuscular injections C. Intracerebral injections
Objective 11 Administer intranasal, intraocular or percutaneous injections to small animals	A. Other sites of injections . Intranasal . Intraocular . Percutaneous

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study for basic information related to anatomy and procedures B. Demonstrations C. Laboratory exercises D. Invite veterinarian to laboratory as a guest speaker and to demonstrate techniques	A. Perform intravenous injections using small animals in the school laboratory B. If possible use skills acquired in work experience programs under the supervision of qualified personnel	A. Written test B. Laboratory performance test C. Work experience grade D. Notebook grade
A. Demonstrations B. Laboratory exercises C. Overlays D. Film strips	A. Perform intraperitoneal injections using school laboratory animals B. Notes on demonstrations, laboratory exercises and teacher-student discussions	A. Laboratory exercises B. Laboratory performance
A. Demonstrations B. Laboratory exercises C. Overlays D. Film strips	A. Perform intradermal, intramuscular and intracerebral injections in small animals B. Laboratory exercises C. Notes on demonstrations and laboratory exercises	A. Performance test B. Laboratory exercise test C. Notebook grade
A. Demonstrations B. Laboratory exercises C. Overlays D. Film strips	A. Perform intranasal, intraocular and percutaneous injections using small animals in the school laboratory B. Notes on demonstrations and laboratory exercises	A. Performance test B. Laboratory exercise test C. Notebook grade

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Calculations used in Animal Care Objective 12 Calculate the different weights and measurements used in animal care	A. Weights and measures B. Equivalents . Weights . Volumes . Linear measurements C. Metric units D. Temperatures
Objective 13 Convert temperature scale readings from centigrade to Fahrenheit and Fahrenheit to centigrade	A. Temperature conversions . Fahrenheit to centigrade . Centigrade to Fahrenheit
Unit 4 - Conditioning Small Animals Objective 14 Handle new, previously unhandled animals	A. Taming new animals . Handling new animals . Feeding new animals . Management of new animals
Objective 15 Use normal animals responses to train small animals such as birds and rats	A. Teaching small animals . Response to noise . Response to colors . Use of reactions for teaching small animals to react

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Classroom discussion C. Demonstrations D. Laboratory exercises	A. Notes on supervised study, classroom discussion, demonstrations and laboratory exercises B. Calculate the different weights and measurements used in small animal care	A. Written test B. Notebook grade C. Laboratory exercise test . Oral . Written
A. Laboratory exercises B. Demonstrations	A. Notes on laboratory exercise B. Assign students to record outdoor temperatures for several days and convert the readings to opposite scale readings	A. Written quiz
A. Supervised study B. Demonstrations C. Field trip to facilities that work with small animals D. Laboratory exercises	A. Handle new, previously unhandled animals in the school's laboratory	A. Performance grade on handling new unhandled animals
A. Laboratory exercises B. Demonstrations C. Supervised study	A. Use normal animal responses to train small animals such as birds and rats	A. Oral quiz B. Laboratory exercise test C. Performance grade

RESOURCE MATERIALS

A. Books -

The I.A.T. Manual of Laboratory Animal Practice and Techniques
D.J. Short & Dorothy P. Woodnott
Charles C. Thomas Pub.
Springfield, Ill.

B. Periodicals

Laboratory Animal Care
Official Publication of the American Association for Laboratory Animal Science.
Joliet, Illionis

C. Refer to package for data

MODULE OF INSTRUCTION

Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS Code - 01.0101010705-01

DESCRIPTION:

The student will relate the legal requirements of maintaining animals in captivity as well as the laws protecting other animals. The laws governing the transportation, laboratory use, showing and sale of animals will be covered. The student will demonstrate how to package an animal for shipment and insure that there is sufficient moisture available to supply the animals needs for water without endangering the health of the animal.

The students will practice the various methods of keeping records on animals required by law as well as those used in business or laboratory use. In keeping records it is important that the individual animals be identifiable. Therefore, the student will practice the various methods of marking the different species of animals. The marking will include the temporary methods such as collars, stains and bands and the permanent methods such as tattooing and ear and toe clipping.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Welfare laws affecting animals	3	4
2. Housing animals	1	8
3. Transporting animals	1	6
4. Marking animals and cages	1	6
	6	24

Revised August, 1975

MODULE OF INSTRUCTION

Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS Code - 01.0101010705-01

OBJECTIVES to be obtained:

The student will be able to:

1. List the basic concepts of the laws governing the welfare of animals.
2. List the basic concepts of the laws affecting animals used in laboratories.
3. List the advantages and disadvantages of various types of caging and cage materials.
4. Properly sanitize all types of laboratory caging.
5. Properly house animals.
6. Set up cartons or cages for transport and plan safe shipment.
7. Receive animals and handle them to insure complete animal safety.
8. Label all types of laboratory caging.
9. Mark animals using collars, leg bands, ear tags, tattooing, ear and toe clipping.
10. Use the markings and keep records on all laboratory animals.

AGRICULTURAL

Module LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS 01.0101010705-01

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Welfare laws affecting animals Objective 1. List the basic concepts of the laws governing the welfare of animals.	A. Federal and State laws affecting animal protection, hunting, fishing, and trapping. . Protecting animals in the fields . Preventing cruelty to animals . Dealing with slaughter and slaughtering . Dealing with work animals . Dealing with show animals
Objective 2. List the basic concepts of the laws effecting animals used in laboratories.	A. Laws effecting laboratories. B. Transportation of laboratory animals. C. Laws effecting dealers of laboratory animals. D. Animal Welfare Act as applied to other areas.

01.0101010705-01 - Code

EDUCATION

LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Classroom lecture and discussion B. Movies C. Supervised study to review state and federal laws D. Field trips to the local conservation headquarters and fields to see how the laws governing animals in the fields operate. E. Guest speakers--animal conservationist, zoologist, game wardens, ASPCA representatives F. Use of specific legal cases concerning animals as examples. G. Field trip to zoo, university, ASPCA.	A. Student will list what actions they would be able to take to correct 10 infractions of laws affecting: . Protection of animals . Prevention of cruelty . Slaughter and slaughtering . Work animals . Show animals B. Use past legal cases regarding legal infractions. Record notes.	A. Written test on: . The basic concepts of the laws affecting: . animals in the field . prevention of cruelty . slaughter and slaughtering animals . work animals . show animals B. Essay question on the steps that may be taken to start the correction of an illegal action connected with animals.
A. State and federal publications, texts, movies. B. Student notes on movies C. Guest speaker--ASPCA inspectors, laboratory veterinarian, breeding farm representative, animal transport person. D. Field trips to laboratories and dealers of laboratory animals to see the effect of the laws.	A. Students will record notes regarding specific legal problems dealing with laboratory animals. B. Have students discuss experiences of past legal cases in their community.	A. Essay questions on: . Laws affecting laboratory animals . Laws governing the sale of animals for laboratory use. . Laws governing the transportation of laboratory animals. B. Notebook grade

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Housing animals Objective 3 List the advantages and disadvantages of various types of caging and cage materials.	A. Types of cages: . Materials used . Cage functions . Cage sizes B. Number of animals permitted in enclosures. C. Types of beddings and cage floors.
Objective 4 Properly sanitize all types of laboratory caging.	A. Methods of cleaning cages . Equipment required . Water . Sanitizers
Objective 5 Properly house animals	A. Selecting proper housing . Environmental considerations . Types of animals . Housing requirements

EDUCATION

01.0101010705.01 - Code

LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration of various types of cages and cage materials. B. Discussion of advantages and disadvantages of each. C. Field trips	A. Students will maintain animals in all types of cages made of various materials.	A. Written test. List the advantages and disadvantages of each type of caging.
A. Demonstration of proper cleaning techniques for caging . Exhibit and discuss different disinfecting agents . Exhibit and discuss various types of bedding.	A. Students will clean all cages properly, using various disinfectants and bedding whenever required to maintain proper sanitation.	A. The student will demonstrate his ability to sanitize 5 different types of laboratory caging properly.
A. Discussion and demonstration of proper . Environmental control . Numbers of animals housed in a given area . Types of housing facilities B. Movies C. Discussion on state and federal publications of laboratory animal housing regulations.	A. Perform experiments in changing the environment of animals and B. Keep records on . Animal behavior . Animal health . Animal disposition C. Keep animals under the best possible environmental condition at all times.	A. Performance grades on laboratory work. B. List the standard regulations for proper temperature, humidity and ventilation for a given animal room. C. Written examination. List the results of sharp changes in . Temperature . Humidity . Ventilation

Code - 01.0101010705-01

Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Transporting animals Objective 6 Set up cartons or cages for transport and plan safe shipment	A. Shipping cartons or cages for shipping animals. . Disposable containers . Returnable cages B. Methods of shipping and requirements
Objective 7 Receive animals and handle them to insure complete animal safety.	A. Air B. Truck or rail C. Temperature and space/animal D. Laws on interstate . Shipping . Receiving
Unit 4 - Marking animals and cages Objective 8 Label all types of laboratory caging.	A. Marking cages . Tags or cards . Records

E D U C A T I O N

01.0101010705-01 - Code

LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Classroom discussion B. Speakers--animal breeders and shippers, technicians dealing with receiving animal shipments.	A. Laboratory exercises in packaging animals for shipment. B. Laboratory exercises in making shipping cartons and cages.	A. Laboratory performance test. . Prepare property transport cages for 5 different species of animals.
A. Field trip to places where animals are shipped and received, animal holding areas at airports and train stations	A. Laboratory exercises in receiving shipments of animals. B. Student notes on field trips	A. Written test on steps to take to ship 3 different species to 3 different locations in the U.S.A. including: . Caging . Shipped-truck or rail . When to be shipped . Temperature and space/animal . Laws affecting shipment . Date and appropriate time animals should be received.
A. Laboratory demonstrations B. Supervised study	A. Laboratory exercises in . Marking cages	A. Laboratory performance test.

Code - 01.0101010705-01

Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS

OBJECTIVES BY UNIT	CONTENT
Objective 9 Mark animals using collars, leg bands, ear tags, tattooing, ear and toe clipping.	A. Marking animals . Collars . Tags . ear . collar . bands (leg) B. Tattooing . small animals . dogs and primates C. Ear and toe clipping D. Stains and dyes
Objective 10 Use the markings and keep records on all laboratory animals.	A. Records required for various types of laboratory animals.

E D U C A T I O N

01.0101010705-01 - Code

LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate the function and use of . All types cage marking systems . Collars, leg bands, ear tags, tattooing, ear and toe clipping . Records in proper animal handling B. Field trips to laboratories, pet stores, hospitals where animals must be marked and records kept.	A. Marking animals individually by as many methods as possible . The student must keep proper records on all resident animals at all times	A. Properly fill out a cage tag for any species of lab animals B. Use all types of marking equipment safely C. Keep records and find information on a particular animal efficiently. 80% accuracy
A. Classroom discussion B. Evaluate sample records acquired from laboratory facilities, pet stores and areas where animals are kept. C. Invite resource people to the classroom to discuss the importance of records. D. Field trips to private and state facilities that work with laboratory animals.	A. Students will keep proper records on all resident animals. B. Notes from classroom discussion, field trips and guest speakers.	A. Grade students on accuracy, neatness and completeness of records kept. B. Field trip reports C. Notebook grades

MODULE OF INSTRUCTION

Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS Code - 01.0101010705-01

RESOURCE MATERIALS

Books:

1. The I.A.T. Manual of Laboratory Animal Practice and Techniques - D.J.Short & Dorothy P. Woodnott, Charles Thomas, Springfield, Ill.
2. Animals and Their Legal Rights - Emily Stewart, et al, Animal Welfare Institute, Washington, D. C.
3. Animal Laws in New York State and New York City - Col. Edmund Rowen, American Society for Prevention of Cruelty of Animals, New York, New York
4. Animals and Animal Products (Title 9) - Regulations and Standards - U. S. Department of Agriculture, Washington, D. C.

Bulletins:

1. Small Animal Bulletins - Ralston Purina, St. Louis, Missouri

MODULE OF INSTRUCTION

Title - GENETICS AND BREEDING OF SMALL ANIMALS

Code - 01.0101010705-02

DESCRIPTION:

The student will learn to establish and maintain the various types of small animal breeding programs. This will include the ability to breed a given number of offspring of a species for delivery on a given date. In order to accomplish this the student must be familiar with the general reproduction of animals. Here the student will learn to identify the various parts of the male and female reproductive systems of the small animals. This knowledge will be further used by the students who will then be able to take and read vaginal smears from small animals for purposes of determining the di-oestrous cycles of the animal.

In order to understand the different types of breeding programs the student will study genetics by breeding homozygotes, heterozygotes and various combinations of each using fruit flies, fish and small mammals. This will enable the student to better understand the inbreeding, line-breeding, and crossbreeding programs that he will be maintaining. The student will learn the gestation times and weaning ages for the various species of small animals being studied as well as some of the common problems encountered in breeding programs. As needed in all breeding programs the student will learn to keep careful records of each program.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Genes and Chromosomes	1	6
2. Genetics	0	4
3. Mammalian Reproduction	1	4
4. Di-oestrous Cycles	1	7
5. Breeding Small Animals	0	2
6. Records	0	2
7. Breeding Programs	1	0
8. Problems of Breeding Animals	1	0
	5	25

Revised August '75

MODULE OF INSTRUCTION

Title - Genetics and Breeding of Small Animals

Code - 01.0101010705-02

OBJECTIVES to be obtained:

The student will be able to:

1. Properly use a microscope.
2. Distinguish chromosomes in cells.
3. Know the normal number of chromosomes for the different species of small animals.
4. Work out the genetic patterns of offspring resulting from matings of homozygotes and heterozygotes and combinations of each.
5. Know the difference between genotypes and phenotypes.
6. Understand the different types of breeding systems such as inbreeding, linebreeding, crossbreeding as well as hybrids and mutations.
7. Identify the different parts of the male and female reproductive organs of small animals.
8. Outline the development of the germ cell to the fetus.
9. Know the gestation times and weaning ages for the various species of small animals.
10. Collect vaginal smears from small animals.
11. Determine the stage of di-oestrous cycles of small animals from vaginal smears.
12. Establish and maintain the various types of breeding programs for small animals.
13. Maintain records for the various types of breeding programs.
14. Establish a breeding program to deliver given numbers of offspring on given days.
15. Be made aware of some of the problems of breeding small animals.

Code - 01.0101010705-02

Title - Genetics and Breeding of Small Animals

OBJECTIVES BY UNIT	CONTENT
Unit 1 Genes and Chromosomes Objective 1 Properly use a microscope.	A. Microscope . Parts of the microscope . Adjusting the microscope . low power . high power B. Preparing slides C. Using prepared slides
Objective 2 Distinguish chromosomes in cells	A. Chromosomes B. Division of chromosomes . Cell division . Diploid and haploid cells C. Sex determination
Unit 2 Genetics Objective 3 Know the normal number of chromosomes for the different species of small animals.	A. Number of chromosomes in different species of animals. . Mice . Cats . Dogs . Large animals . Birds . Fish . Fruit flies

EDUCATION

01.0101010705-02 - Code

Genetics and Breeding of Small Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Laboratory demonstrations B. Use drawings of a microscope for identifying parts of a microscope.	A. Complete laboratory exercises on the use of a microscope. B. Students prepare slides for microscope studies.	A. Performance grade on laboratory procedures using a microscope. B. Written test on microscope using blank diagrams of a microscope.
A. Transparencies related to chromosomes, cell division and sex determination. B. Teacher demonstrations using laboratory equipment and facilities. C. Slides D. Class discussion E. Laboratory exercises	A. Complete laboratory exercises B. Notes on transparencies, slides and class discussion.	A. Laboratory exercise written test. B. Performance test on handling laboratory equipment. C. Written test on cell division and chromosomes.
A. Teacher lecture B. Supervised study C. Slides D. Laboratory demonstrations and exercises	A. Class notes B. Laboratory exercise grade	A. Written test B. Laboratory exercise test.

Code - 01.01010107-5-02

Title - Genetics and Breeding of Small Animals

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Objective 4 Work out the genetic patterns of offspring resulting from matings of homozygotes and heterozygotes and combinations of each.	A. Definition of common genetic terms . Heredity . Environment . Genes . Mitosis . Homozygotes B. Genetic patterns
Objective 5 Know the difference between genotypes and phenotypes.	A. Genotype B. Phenotype C. Dominant
Objective 6 Understand the different types of breeding systems such as inbreeding, linebreeding, crossbreeding as well as hybrids and mutations.	A. Types of breeding systems . Inbreeding . Linebreeding . Crossbreeding B. Hybrids C. Mutations - gene abnormalities D. The laws of heredity E. Definitions of common terms

EDUCATION

01.0101010705-02 - Code

Genetics and Breeding of Small Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Chalk and board illustrations B. Class discussion C. Genetic pattern charts	A. Student notes	A. Written test on definitions B. Notebook grade C. Oral examination on genetic patterns.
A. Demonstrations on the inheritance of characters in fruit flies, fish, mice and birds. B. Laboratory exercises in genetics related to breeding of animals. C. Supervised study D. Teacher - student class and laboratory discussion E. Slides and movies	A. Laboratory exercises in breeding fruit flies, fish, mice, birds and other laboratory animals. B. Notes on demonstrations, slides, movies and laboratory exercises.	A. Written test B. Laboratory test C. Notebook grade
A. Chalk and board B. Supervised study C. Film strips D. Laboratory exercises E. Movies F. Demonstrations using laboratory animals.	A. Notes on classwork, laboratory exercises and demonstrations B. Assign projects to advanced students. C. Have advanced students work with other class members in laboratory exercises.	A. Written test B. Notebook grade on class discussion, supervised study questions, film strips and laboratory exercises. C. Oral questions for higher ability students.

Code - 01.0101010705-02

Title - Genetics and Breeding of Small Animals

OBJECTIVES BY UNIT	CONTENT
Objective 7 Identify the different types of breeding parts of the male and female reproductive organs of small animals.	A. Reproductive systems . Male reproductive system . Female reproductive system . Germ cells B. Embryonic development . Zygote . Fetus C. Gestation and Parturition . Gestation tables . Parturition
Objective 8 Outline the development of the germ cell to the fetus	A. Germ cell . Point of fertilization B. Development of embryo C. Fetal membranes or placenta D. Estrus Cycle E. Hormones involved during pregnancy F. Fetal development G. Key words and definitions
Objective 9 Know the gestation times and weaning ages for the various species of small animals	A. Gestation . Time table for fetus development . Parturition B. Weaning ages . Laboratory animals . Other small animals

EDUCATION

01.0101010705-02 - Code

Genetics and Breeding of Small Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Class discussion C. Demonstrations D. Laboratory exercises E. Visual aids and models of male and female reproductive tracts. F. Slides G. Movies H. Obtain reproductive organs from slaughter house animals male and female. Use organs to illustrate the anatomy and function of the organs. G. Field trip to slaughter house.	A. Class, laboratory and field trip notes. B. Collect organ samples from slaughter houses in the area preserve the organs in glass containers with proper solutions.	A. Written test B. Laboratory exercise test. C. Notebook grades
A. Supervised study B. Diagrams of cell and fetal development C. Slides D. Movies E. Examine reproductive tracts of female avain species laboratory exercise . Reproductive tract . Oviduct	A. Incubate fertilized eggs B. Notes on laboratory exercises C. Acquire birds for laboratory exercises.	A. Written test B. Notebook grade C. Oral quiz D. Performance grade on posting avain species and identification of organs, their functions in fetus development.
A. Supervised study B. Classroom discussion C. Used prepared gestation and weaning charts.	A. Notes on supervised study and classroom discussion.	A. Written test B. Oral test

Code - 01.0101010705-02

Title - Genetics and Breeding of Small Animals

OBJECTIVES BY UNIT	CONTENT
Objective 10 Collect vaginal smears from small animals.	A. Obtaining vaginal smears
Unit 4 Di-oestrous cycles Objective 11 Determine the stage of di-oestrous cycles of small animals from vaginal smears.	A. Obtaining and reading smears and other methods of determining stages of di-oestrous cycles. . Guinea pig . Rabbit . Mice . Rats . Cats . Dogs . Other animals
Unit 5 Breeding Small Animals Objective 12 Establish and maintain the various types of breeding programs for small animals.	A. Choosing a breeding system . Inbreeding . Random breeding . Harems or monogamous pairs . Cross breeding B. Selection of breeding stock
Unit 6 Records Objective 13 Maintain records needed for breeding programs.	A. How to keep records . Simple . Accurate . Complete B. Types of records . Males . Females offspring

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Classroom discussion B. Demonstrations C. Laboratory exercises	A. Complete laboratory exercises. B. Notes on classroom discussion and demonstrations.	A. Performance grade on laboratory exercise.
A. Demonstrations B. Laboratory exercises	A. Record laboratory exercise data. B. Notes on teacher demonstrations.	A. Performance grade on laboratory exercise. B. Oral or written test on procedures of obtaining and reading smears.
A. Supervised study B. Chalk and board C. Demonstrations D. Laboratory exercises E. Movies F. Field trip to research center using small animals	A. Students could establish and maintain breeding systems required for laboratory exercises involving small animal colonies.	A. Written report on establishing and maintaining small animal colonies. Check on breeding systems used and rationale for the breeding systems selected.
A. Supervised study B. Review record forms C. Laboratory exercises	A. Keep records on animals in the school laboratory. B. Keep records on supervised work experience projects.	A. Grade on laboratory records. B. Supervised work experiences program records.

Code - 01.0101010705-02

Title - Genetics and Breeding of Small Animals

OBJECTIVES BY UNIT	CONTENT
Unit 7 Breeding Programs Objective 14 Establish a breeding program to deliver given numbers of offspring on given days.	A. Scheduling breeding to obtain given numbers of one sex of small laboratory animals. B. Scheduling breeding for production of offspring for particular dates.
Unit 8 Problems of breeding animals Objective 15 Be made aware of some of the problems of breeding small animals.	A. Pseudo - pregnancy B. Sterility C. Over stock D. Reabsorption and miscellaneous problems

01.0101010705-02 - Code

Genetics and Breeding of Small Animals - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrations B. Laboratory exercises	A. Notes on demonstrations and laboratory exercises.	A. Written test B. Laboratory exercise grade.
A. Invite veterinarian to class, to discuss small animal breeding problems. B. Supervised study C. Field trips to facilities breeding small animals for laboratory purposes. D. Demonstrations using post-mortem of small animals to illustrate breeding problems.	A. Notes on guest speaker, supervised study, field trips, and demonstrations.	A. Written test matching questions and essay questions. B. Notebook grade C. Laboratory exercises grades. D. List problems associated with small animal breeding problems.

MODULE OF INSTRUCTION

Title - Genetics and Breeding of Small Animals

Code - 01.0101010705-02

RESOURCE MATERIALS

Books:

I.A.T. Manual of Laboratory Practice
and Techniques
D. J. Short & Dorothy P. Woodnott
Charles C. Thomas
Springfield, Illinois

Animals for Research Principles of
Breeding and Management
W. Lane-Petter
Academic Press
New York, New York

Audiovisual Films:

Cell Division and Growth
Abbott Laboratories
North Chicago, Ill.

1. Laws of Heredity
2. Meiosis
3. Mitosis
4. The Frog
5. Lambing
6. Reproduction Among Animals

The above films may be obtained from
Encyclopedia Britannica Education Dept.
Chicago, Ill.

1. Genetics: Mendel's Law
2. Reproduction in Animals

The above films may be obtained from
Coronet Instructional Film
Chicago, Ill.

The Thread of Life
Obtained through your Telephone Co.

1. Mendel's "Segregation"
2. Mendel's "Recombination"
3. Reproduction System
4. Chick Embryo: Life is Born
5. Theories of Development

The above films may be obtained
from McGraw-Hill Book Co.
New York, New York

MODULE OF INSTRUCTION

Title - FEEDS AND NUTRITION FOR SMALL ANIMALS

Code - 01.0101010705-03

DESCRIPTION:

The student will learn the functions of the different nutrients in the animal diets. In learning the functions of the various nutrients the student will recognize some of the more common symptoms of vitamin and other nutritional deficiencies in small animals. The students will be made aware of the problems encountered in over or underfeeding small animals. In order to prevent these problems the student will learn to set up proper feeding schedules for all the animals in his care. The student will learn to prepare normal and special diets for animals. Since in some cases the animals are fed sterile diets the students will be made aware of the different methods of sterilization used for feeds and the problems of using these methods. Since many types of feed are supplements and not complete diets the students will learn to tell the difference between supplements and whole diets from the labels. The student will learn to make up special diets for newborn small animals and be able to set up feeding schedules and feed these newborn animals properly.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Nutrients	1	2
2. Specific Requirements for Different Animals	1	4
3. Preparation of Diets	0	5
4. Preparation of Pellets	0	3
5. Preparation of Sterile Diets	0	4
6. Preparation of Feed for Newborn	0	6
7. Feeding Animals	0	4
	2	28

Revised August '75

MODULE OF INSTRUCTION

Title - FEEDS AND NUTRITION FOR SMALL ANIMALS

Code - 01.0101010705-03

OBJECTIVES to be obtained:

The student will be able to:

1. Recognize some of the symptoms of vitamin deficiencies in small animals.
2. Recognize some of the mineral and other deficiencies in small animals.
3. Learn the basic nutritional requirements for the different species of small animals.
4. Be aware of the problems encountered as a result of over or underfeeding animals.
5. Prepare properly nutritionally balanced diets for the different species of small animals.
6. Distinguish between a complete diet and a supplement from reading the labels on the different animal feeds.
7. Prepare feed for newborn animals.
8. Know the various methods of sterilizing animal feeds and the advantages and disadvantages of each method.
9. Set up proper feeding schedules for newborn small animals.
10. Set up feeding schedules for all the different types of small animals used in the instructional program.

Code - 01.0101010705-03

Title - FEEDS AND NUTRITION FOR SMALL ANIMALS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Nutrients Objective 1 Recognize some of the symptoms of vitamin deficiencies in small animals	A. Water B. Proteins C. Carbohydrates D. Fats E. Minerals F. Vitamins
Unit 2 - Specific Requirements for Different Animals Objective 2 Recognize some of the mineral and other deficiencies in small animals	A. Deficiency Symptoms . External symptoms . Internal . Unthrifty animals B. Improper nutrient balance and diet . Fat content . Minerals . Vitamins . Proteins . Carbohydrates
Objective 3 Learn the basic nutritional requirements for the different species of small animals	A. Major nutrients B. Minor nutrients . Trace minerals C. Lipid needs

E D U C A T I O N

01.0101010705-03 - Code

FEEDS AND NUTRITION FOR SMALL ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised Study B. Slides and movies C. Demonstrations D. Laboratory exercises on animal diets, deficiencies and balanced rations E. Stress the importance of water,proteins,carbohydrates, fats,minerals and vitamin needs of small animals	A. Laboratory exercises B. Notes on supervised study, slides,movies,demonstrations and class discussions	A. Written examination B. Laboratory exercises C. Notebook grade
A. Supervised Study B. Films C. Slides D. Laboratory exercises E. Field trips	A. Laboratory exercises involving deficient and overdose diets showing effects of vitamin,mineral,protein,fat, carbohydrate and water deficiencies	A. Laboratory exercise test B. Written test on total content C. Notebook grade
A. Supervised study B. Laboratory exercises C. Movies--Filmstrips	A. Class,laboratory and movie notes B. Laboratory exercises	A. Written test B. Laboratory test

Code - 01.0101010705-03

Title - FFEDS AND NUTRITION FOR SMALL ANIMALS

OBJECTIVES BY UNIT	CONTENT
Objective 4 Be sure of the problems encountered as a result of over or underfeeding animals	A. Overfeeding animals . Excess weight . Breeding problems . Economics B. Underfeeding . Deficiencies . reproduction . less resistance to diseases
Unit 3 - Preparation of Diets Objective 5 Prepare properly nutritionally balanced diets for the different species of small animals	A. Routine Diets B. Special Diets . Deficiency diets . by deficiency . by blockage C. Antibiotics, hormones and other growth stimulants
Objective 6 Distinguish between a complete diet and a supplement from reading the labels on the different animal feeds	A. Complete diet . Define a complete diet B. Supplements

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Teacher--class discussion C. Demonstrations D. Movies	A. Notes on supervised study, class discussion, demonstrations and movies	A. Written test B. Notebook C. Credit for students work experience programs
A. Supervised study B. Laboratory exercises C. Demonstrations D. Movies E. Filmstrips	A. Read and analyze feed tags of commercially prepared small animal feeds B. Notes on supervised study, laboratory exercises, demonstrations and movies	A. Written examination B. Laboratory exercises C. Oral quiz
A. Teacher--class discussion B. Laboratory exercises C. Field trip	A. Students can acquire feed tags from small animal feed dealers B. Write to companies that formulate commercial small animal feeds	A. Laboratory exercises B. Oral quiz

Code - 01.0101010705-03

Title - FEEDS AND NUTRITION FOR SMALL ANIMALS

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Preparation of Pellets Objective 7 Prepare feed for newborn animals	A. Mice and rats B. Guinea pigs C. Rabbits D. Cats and dogs E. Hamsters . Ground feeds . Pellets . Liquids
Unit 5 - Preparation of Sterile Diets Objective 8 Know the various methods of sterilizing animal feeds and the advantages and disadvantages of each method	A. Basic ingredients B. Problems of sterilization . Methods of sterilization . Supplements C. Quality control methods relating to feeds . Laboratory determination . nutritional . microbiological
Unit 6 - Preparation of Feeds for Newborn Objective 9 Set up proper feeding schedules for newborn small animals	A. Mice and rats B. Guinea pigs C. Rabbits D. Cats E. Dogs F. Hamsters G. Avian species H. Others

01.0101010705-03 - Code

FEEDS AND NUTRITION FOR SMALL ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Teacher--student class discussion C. Demonstrations D. Laboratory exercises	A. Notes on supervised study, class discussion, demonstrations and laboratory exercises	A. Written test B. Laboratory exercises
A. Supervised study B. Demonstrations C. Laboratory exercises	A. Notes on supervised study, demonstrations and laboratory exercises	A. Laboratory exercise test B. Written test C. Performance test on sterilizing feeds
A. Demonstrations B. Laboratory exercises C. Supervised study . Feeding schedules . Feed preparation	A. Laboratory demonstrations and supervised study notes	A. Performance test B. Laboratory exercise test

Code - 01.0101010705-03

Title - FEEDS AND NUTRITION FOR SMALL ANIMALS

OBJECTIVES BY UNIT	CONTENT
Unit 7 - Feeding Animals Objective 10 Set up feeding schedules for all the different types of small animals used in the instructional program	A. Schedules . Fish . Reptiles . Amphibians . Birds . Mammals B. Reasons for schedules . Advantages of feeding on schedule . Disadvantages of feeding off schedule

01.0101010705-03 - Code

FEEDS AND NUTRITION FOR SMALL ANIMALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Field trips to zoos and animal farms C. Laboratory demonstrations	A. Set up proper feeding schedules for specific animals B. Supervised study, field trip and laboratory demonstration notes	A. Laboratory exercises B. Oral quiz C. Notebook grades

MODULE OF INSTRUCTION

Title - FEEDS AND NUTRITION FOR SMALL ANIMALS   Code - 01.0101010705-03

RESOURCE MATERIALS

A. Books -
1. I.A.T. Manual of Laboratory Animal Practice and Techniques -
   D. J. Short & Dorothy P. Woodnott, Charles C. Thomas Publisher, Springfield, Illinois
2. Manual for Laboratory Animal Care - Ralston Purina Company, St. Louis, Missouri
3. Animal Nutrition - Maynard, L.A. & J. K. Loosli, McGraw Hill
4. Animal Nutrition - C. Tyler, Chapman and Hall

B. Animal Science Technology - An Experimental Development Program, Volume II, Curriculum Course Outlines. Division of Comprehensive and Vocational Education Research and Development, U.S. Office of Education, Washington, D. C. 20202

C. Standards for the Breeding, Care and Management of Laboratory Rats, Mice, Rabbits, Cats, Guinea Pigs, Hamsters, and Laboratory Dogs - Institute of Laboratory Animal Resources Material Research Council, National Academy of Sciences, National Academy of Engineering, 2101 Constitution Avenue, N.W., Washington, D. C. 20418

D. Audiovisual Aids
   Films
   - Alimentary Tract
   - Digestion of Feeds
   - The Digestive System
   - Foods and Nutrition

   The above films may be obtained from Encyclopedia Britannica Education Corporation, Chicago, Illinois

D. Audiovisual Aids Cont:

Films
The Avitaminoses 2x2 color slides
Maryland Society for Medical Research
Baltimore, Maryland

Digestion (Parts 1 & 2)
University of California
Berkeley, California

Feeding for Health
Friskies Pet Digest
Los Angeles, California

Vitamins and Some Seficiency Diseases
Lederle Laboratories, American Cyanamid Co.
Pearl River, New York

Vitamins and Your Health
Eli Lilly and Co.
Indianapolis, Indiana

MODULE OF INSTRUCTION

Title - REPAIR OF EQUIPMENT Code - 01.0101010705-04

DESCRIPTION:

The student will learn to repair animal cages. In the case of wire cages the student will learn to bend wires and where needed spot weld new wires in replacement of old. With the solid metal cages or metal trays the student will learn to cut and bend the sheets of metal and spot weld sides together. Emphasis will be placed on keeping sharp edges from contact with animals. The student will also learn to repair fish tanks by either replacing glass sides or cases of leaks simple repairs of joints. The student will learn to check pump motors and replace belts and brushes were needed. With heaters used in fish tanks and as hair dryers the students will learn to check and replace defective parts. Since many of the restraining devices used with animals are made of leather the students will learn to sew or rivet leather goods. The students will also learn to devise and install special animal equipment such as automatic watering devices, metabolism and exercise cages and various types of mazes.

This training should enable the student to repair and replace broken equipment in various types of animal quarters such as laboratories, pet stores and other areas where animals are used or sold.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Repair of Cages	0	7
2. Repair of Air and Water Pumps	0	6
3. Repair of Heaters	0	5
4. Repair of Leather Goods	0	4
5. Development and Repair of Special Equipment	0	2
	0	30

Revised August '75

MODULE OF INSTRUCTION

Title - Repair of Equipment

Code - 01.0101010705-04

OBJECTIVES to be obtained:

The student will be able to:

1. Repair wire or metal cages.
2. Spot weld wires or metal joints together.
3. Make repairs on plastic cages.
4. Glass sides on fish tanks.
5. Stop leaks in fish tanks.
6. Check air and water pumps and replace belts and brushes where needed.
7. Check fish tank heater and replace parts where needed.
8. Check hair dryers and replace heating elements, wires and fix blowers where needed.
9. Sew leather goods and make various restraining and other devices of leather used on animals.
10. Install and repair automatic watering devices and other special (simple) equipment used with animals such as mazes, metabolism and exercise cages.

Code - - 01.0101010705-04

Title - Repair of Equipment

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Repair of Cages **Objective 1** **Repair wire or metal cages.**	A. Wire replacement . Bending wire . Spot welding
Objective 2 Spot weld wire or metal joints.	B. Metal Cages . Bending metal sheets . Cutting sheet metal
Objective 3 Make repairs of plastic cages	C. Plastic cages . Types of plastic cages . Repair of plastic cages
Objective 4 Replace glass sides on fish tanks.	D. Glass tanks . Replacing glass in tanks . Stopping water leaks in tanks
Objective 5 Stop leaks in fish tanks.	
Unit 2 - Repair of Air and Water Pumps Objective 6 Check air and water pumps and replace belts and brushes where needed.	A. Checking pumps . Vibrator . Piston . replacing belts . replacing motor brushes . checking motors

EDUCATION

01.0101010705-04 - Code

Repair of Equipment-Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Each one of the skills in this unit will be demonstrated by the instructor to indicate the proper and most efficient method of repair. B. Teacher must emphasize such things as the proper tools needed for each equipment repair and the safety precautions that must be observed while making the repairs. C. A field trip to a shop that repairs small equipment would be good if such a place is available. In some cases there may be a resource person available to help teach certain techniques concerning repair.	A. Each student will be given sections of wire of the same gauge as the animal cages are built of. Using the proper tools the student will bend and spot weld these wires. B. Sheet metal strips of the same gauge used in animal cages will be bent, cut and joined. C. Plastic strips will be glued together using strips similar to plastics used in cages. D. Glass will be cut of the proper dimensions to fit in the sides and bottom of a tank frame. The proper waterproof substances will be used.	A. Each student's work will be evaluated individually. The evaluation will be in relationship to the product demonstrated by the instructor or resource person.
A. The instructor or resource person will disassemble pumps of various makes to point out the various parts and how to spot defects and make repairs necessary to get the pump in working order. B. Motors will be checked to indicate how brushes and belts should be changed.	A. Each student will disassemble and reassemble a pump and check a motor for the renewal of brushes and belts.	A. The students performance in disassembly and assembly of pumps and motors will be his evaluation.

Code -- 01.0101010705-04

Title - Repair of Equipment

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Repair of Heaters Objective 7 Check fish tank heater and replace parts where needed. Objective 8 Check hair dryers and replace elements, wires, and fix blowers where needed.	A. Fish tank heaters . Adjusting thermostats . Replacing parts . Fixing and replacing wires on fish tank lights B. Hair dryers . Checking wires . Replacing heating elements . Checking and fixing fans and blowers
Unit 4 - Repair of Leather Goods Objective 9 Sew leather goods and make various restraining and other devices of leather used on animals.	A. Sewing leather B. Riveting leather C. Embedding hooks and swivels in leather D. Making leather holders, muzzles and other restraints.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. The teacher will demonstrate the repair and adjusting of tank heaters and hair dryers. B. Various heaters and dryers of various makes should be "bugged" and given to the student to find the defective part or area and put new parts in their place. C. Have factory representatives demonstrate their products and how they can be serviced when the need arises.	A. Each student will be expected to keep a notebook on the repairs of equipment. The notebook should include the potential problem area and how they could be remedied. B. Each student will be given heaters and hair dryers that have been "bugged" for them to troubleshoot, and repair.	A. The students notebook will be graded as to the proper points which may need repair and how to repair them. B. The student will be evaluated on his ability to troubleshoot a "bugged" piece of equipment and repair the equipment to working order.
A. Teachers will demonstrate the methods of cutting and joining leather. B. Patterns for various leather equipment will be reviewed with students. It would be a good idea to have one completed leather item to examine for each pattern. C. Review how various patterns will need to be altered for various size animals. D. Review methods of cleaning leather and keeping it soft.	A. The student will be given pieces of leather to be used for practice . Cutting . Joining . glue . rivets . stitching with thread . stitching with leather B. Each student will make one leather product which could be used with small animals according to a pattern given him by his instructor or approved by the instructor.	A. Each of the various methods of cutting and joining leather will be evaluated as the student completes them. B. The leather item produced by the student will be graded as to how close it is to the pattern design as well as the workmanship.

Code -- 01.0101010705-04

AGRICULTURAL

Title - Repair of Equipment

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Development and Repair of Special Equipment Objective 10 Install and repair automatic watering devices and other special (simple) equipment used with animals such as mazes, metabolism and exercise cages.	A. Automatic watering devices . Installation of watering devices . Repair of leaks and plugged devices B. Metabolism cages . Small rodent type . Cat or dog type C. Exercising cages . Rodent . Cat or dog . Primate D. Mazes and psysiological testing equipment . Mazes, types and construction . Skinner boxes . Flash color or card boxes . Special problem boxes . Bell systems . Other equipment

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Each segment of this unit will be demonstrated by the instructor. The automatic watering devices will be set up and the possible trouble spots will be pointed out.	A. Each student will be expected to be able to set up a watering system for a particular type of small animal.	A. Each student's notebook will be evaluated as to proper content.
B. Students will be shown how to repair leaks in what ever type of tubing is found on the water systems. Students will need practice in copper and plastic pipe repair.	B. A notebook with the various types of watering devices should be compiled. This notebook should include tips on repairing problems in watering systems for future reference.	B. Each student will be expected to properly set up a watering system for any small animal designated by the instructor or repair an existing watering system.
C. Specialized cages will be brought into class for review. Factory representatives may be contacted to bring in a greater selection of these specialty items. The set up and care of these cages could then be reviewed for the students.	C. Students should keep notes on the various types of cages as they are demonstrated by the instructor or factory representative so they will know the following . Use of various cages and equipment . Set up . Maintenance	
D. Specialty catalogs can be obtained from companies making these products for student review.		

RESOURCE MATERIALS

A. Books-

I.A.T. Manual of Laboratory Animal Practice and Techniques
Short and Woodnott
Charles Thomas Pub.
Springfield, Ill.

UFAW Handbook on Care and Management of Animals
UFAW Staff
London, England

MODULE OF INSTRUCTION

Title - CARE AND GROWING OF INSECTS Code - 01.01010199-01

DESCRIPTION:

The student will learn to identify the different types of insects. He will also learn to raise and grow different types of insects such as ants and bees as well as several different species of beetles. Others would include grasshoppers, katydids, crickets, moths and butterflies, as well as mantis and walking sticks.

This will enable the student to have a constant supply of insects for feeding his insect eating animals. At the same time the student will be introduced to biological control and the role of insects in conservation and his environment.

Emphasis will be placed on growing insects which can be used as safe biological controls of other insects or routinely used as food for other animals.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Establishing an Ant Colony		6
2. Growing Beetles in Captivity		6
3. Growing Grasshoppers and Crickets		4
4. Growing Mantis and Walking Sticks		3
5. Raising Butterflies and Moths		4
6. Bee Keeping		6
7. Uses of Insects	1	
	1	29

Revised August 1975

MODULE OF INSTRUCTION

Title - CARE AND GROWING OF INSECTS

Code - 01.01010199-01

OBJECTIVES to be obtained:

The student will be able to:

1. Set up and maintain an ant colony.
2. Distinguish a queen ant from the rest of the ants in a colony.
3. Raise lady-bird beetles in captivity.
4. Raise grain and other common beetles in captivity.
5. Recognize the different stages of beetles, such as the egg, larvae, pupae and adult.
6. Raise grasshoppers, katydids and crickets in captivity.
7. Raise mantis and walking sticks in captivity.
8. Distinguish the differences between moths and butterflies..
9. Raise moths and butterflies in captivity.
10. Identify the different types of bees.
11. Set up a beehive.
12. Recite the natural benefit and use of some of the insects while still being able to recognize those insects which are harmful.

Code - 01.01010199-01

Title - CARE AND GROWING OF INSECTS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Establishing an Ant Colony Objective 1 Set up and maintain an ant colony	A. Types of cages or quarters for ants . Visual study cases . Migration boxes B. Obtaining colonies . General colonies . queen ants . complete colonies C. Feeding and watering ants D. Problems in raising ants in captivity
Objective 2 Distinguish a queen ant from the rest of the ant colony	
Unit 2 - Growing Beetles in Captivity Objective 3 Raise lady-bird beetles in captivity	A. Lady-bird beetles B. Grain beetles (mealworms and others) C. Other beetles easily grown in captivity
Objective 4 Raise grain and other common beetles in captivity	
Objective 5 Recognize the different stages of beetles, such as egg larvae, pupa and adult.	

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES

A. Review the following points with the class
. Different types of ants
. How to distinguish the queen ant
. Feeding of the colony
. Setting up a study case
  . Materials
  . Soil
  . Moisture
B. Set up a small study case as a demonstration
. Put ants in the case after it has been set up
	A. Students will put information in notebooks about ants and their case
	B. Each student will set up a study case and keep it active during this module
		A. Notebook material will be evaluated
		B. The individual study cases will be evaluated as to function and design

A. Review with the class the practical methods of establishing a growing box for lady-bird beetles . Review the proper medium lady-bird beetles need to grow . Temperature . Food . Moisture B. Uses of beetles C. Review life cycles of beetles	A. Information on care and raising beetles for food should be put in notebook B. Students should be assigned to care for the beetles in laboratory	A. Review notebooks and grade B. Oral test on the methods of raising lady-bird beetles

Code - 01.01010199-01

Title - CARE AND GROWING OF INSECTS

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Growing Grasshoppers and Crickets Objective 6 Raise grasshoppers, katydids and crickets in captivity	A. Growing grasshoppers . Types of grasshoppers . Katydids B. Crickets C. Types of cages and feed D. Food for small animals E. Review life cycles
Unit 4 - Growing Mantis and Walking Sticks Objective 7 Raising mantis and walking sticks in captivity	A. Obtaining and caring for egg cases B. Hatching and raising young . Cannibalism . Feeding and watering . Housing and preventing escaping . Adults
Unit 5 - Raising Butterflies and Moths Objective 8 Distinguish the differences between moths and butterflies Objective 9 Raise moths and butterflies in captivity	A. Butterflies . Raising larvae . Storing cocoons . Adult butterflies B. Moths . Hatching cocoons . Mating adults . Collecting eggs . Raising larvae

01.01010199-01 - Code

EDUCATION

CARE AND GROWING OF INSECTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Review methods of identifying grasshoppers,katydids and crickets B. Collect these insects during summer with sweep nets and baited traps C. Visit labs that raise these insects for food D. Construct a cage from fine mesh wire to house insects as a demonstration and then allow them to build their own holding cage	A. Information in notebook on raising grasshoppers, katydids and crickets B. Construct a cage to hold these insects and collect insects to start your own collection	A. Notebook evaluation B. Oral evaluation on the process of raising these insects for laboratory use including the life cycles, food, housing needs and problems in raising
A. Review the identifying characteristics of butterflies and moths and the differences between them. This can be done by the use of charts, movies, slides or mounted samples of each . Visit to local museum . Invite a museum person in who is knowledgable on butterflies and moths with samples and mounted specimens B. Collect specimens with a sweep net and raise these to observe the various stages of development	A. Place information in notebook which is presented by instructor or resource person on: . Differences between butterflies and moths . How to raise . Where and how to collect . Storage of cocoons . Food B. Collect specimens with traps, lights and sweep nets C. Make a mount board of both butterflies and moths	A. Notebook evaluation B. Orally tell the main differences between butterflies and moths. Tell how each is most successfully raised and review the life cycles of each

OBJECTIVES BY UNIT	CONTENT
Unit 6 - Bee Keeping Objective 10 Identify the different types of bees	A. Types of bees B. Types of hives C. Maintaining beehives . Equipment . Methods . Problems . diseases . bee enemies . Recovering honey . methods of keeping bees from getting excited during collection of honey and working with supers
Unit 7 - Uses of Insects Objective 12 Recite the natural benefit and use of some of the insects while still being able to recognize those insects which are harmful	A. Feed for other animals . Other insects . Fish and birds . Mammals and reptiles B. Ecology and conservation . For teaching . Aerating soil . Recycling of waste materials C. Harmful insects . Destroy crops . Bite or sting

RESOURCE MATERIALS

A. **Books -**

Raising Laboratory Animals
James Silvan
American Museum of Natural History
New York, New York.

Experimental Entomology
Kenneth W. Cummins, et al
Reinhold Publishing Co
New York, New York

Rearing Insects in Schools
R.E. Siverly
Wm. C. Brown Co.
Dubuque, Iowa

B. **Bulletins -**

MODULE OF INSTRUCTION

Title - FEEDS AND FEEDING

Code - 01.010102-01

DESCRIPTION:

In this module students will develop skills needed to determine animal nutritional needs, calculate nutritional values of feeds, select animal feeds, and follow recommended practices in feeding livestock.

Students will be given the opportunity to develop a feeding program for either beef, dairy, horses, poultry, sheep, or swine.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Digestive Tract	1	2
2. Meeting Nutritional Needs of Livestock	2	6
3. Selecting Feeds to use for Livestock	1	4
4. Determining Livestock Feeding Practices	1	9
5. Balancing a Ration	2	2
	7	23

Revised June, '74

MODULE OF INSTRUCTION

Title - FEEDS AND FEEDING   Code - 01.010102-01

Objectives to be obtained:

The student will be able to:

1. List the parts of the digestive tract and the contribution of each part to the digestive process for the various species of livestock.
2. Correctly determine the nutritional needs of livestock, using references containing the necessary information.
3. Correctly calculate the nutritional value of a given feed, using references containing the necessary information.
4. Correctly determine how much of a given feed or feeds is required to meet livestock nutritional needs, using references containing the necessary information.
5. Choose, to the instructor's satisfaction, feeds to use for a given class of livestock.
6. Determine, to the instructor's satisfaction, five practices to follow in feeding a given class of livestock.
7. Prepare, to the instructor's satisfaction, a plan for feeding one class of livestock on a given farm.
8. Determine how to balance rations that will provide nutrients required for various species of livestock.

Code - 01.010102-01

Title - FEEDS AND FEEDING

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Digestive Tract Objective 1 List the parts of the digestive tract and the contribution of each part to the digestive process for the various species of livestock.	A. Ruminants . Dairy Cattle . Beef Cattle . Sheep B. Simple Stomach . Horse . Swine C. Poultry
Unit 2 - Meeting nutritional needs of livestock Objective 2 Correctly determine the nutritional needs of livestock, using references containing the necessary information.	A. Determining needs of livestock . Maintenance . Production . Reproduction . Growth B. Nutrients to consider in meeting livestock needs . Energy . carbohydrates . fats and oils . protein . Protein . Vitamins . Minerals . Water C. Calculating nutritional needs . Net energy, estimated net energy, total digestible nutrient measurements . Determining energy, protein, vitamins and mineral needs.

01.010102-01 - Code

FEEDS AND FEEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Film - "The Rumen Story" Cornell Film Library C. Overhead projector using appropriate overlags for all types of livestock.	A. From mimeos of Digestive Tracts student will label parts of Ruminants and Single Stomach Animals and list the functions of all parts of the digestive tract.	A. Written Test . Label the parts of the digestive tracts. . Match-up on functions of digestive tract.
A. Class discussion problem solving calculating nutritional needs. B. Supervised study . Identify the nutrients that require the most attention.	A. Take notes during lecture discussion. B. Read appropriate sections in resource material. C. Students will solve animal nutrition requirements using teacher prepared problems or actual situations.	A. Written test . Solving animal nutrient requirement problems.

Code - 01.010102-01

Title - FEEDS AND FEEDING

OBJECTIVES BY UNIT	CONTENT
Objective 3 Correctly calculate the nutritional value of a given feed, using references containing the necessary information.	A . Types of feeds - . Roughages . hay . alfalfa . trefoil . clover . timothy . bromegrass . sudan grass Silage . corn Silage . haylage . sorghum . Concentrates . corn . oats . wheat . buckwheat . rye . barley . Cereal grain by-products B . Measuring nutritional values of feed stuff . Digestibility (E.N.E., N.E., T.D.N.) . Composition . energy . protein . minerals . vitamins . water
Objective 4 Correctly determine how much of a given feed or feeds is required to meet livestock nutritional needs, using references containing the necessary information.	A . Determining proportion of concentrate and roughage to feed - . Recommended practices . Individual situations . Using Pearson's square B . Meeting the animals energy needs C . Meeting the animals protein needs D . Meeting the animals vitamins and mineral needs E . Meeting the animals water needs

EDUCATION

01.010102-01 - Code

FEEDS AND FEEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A . Lecture - discussion to teach basic information B . Chart the values of each roughage and grain for D.P. T.D.N., and cost. C . Identify each cereal grain and grain by-product - obtain from local feed dealer. D . Demonstration • Obtain forage analysis from tested feeds to compare visual observations with chemical analysis. • Burn feeds to show their energy and the ash (minerals left). • Calculate nutritional values of feeds. • Test moisture in feeds to determine % of dry matter. E. Class problem solving.	A . Take notes on information presented. B . Study related information in available resource material. C . Observe and take part in demonstrations and identifications. D . Work out given problems calculating the nutritional values of different feeds. E . Analyze tags from dairy, poultry, horse, swine and beef feeds.	A . Feed identification of roughages and concentrates. B . Written test - involving the determination nutritional values of feeds.
A . Lecture - discussion to show calculations required. Sample problems will be needed. B . Field trip to local feed dealer who balances rations for farmers. C . Individual supervised study D . Class problem solving	A . Take notes on sample calculations. B . Students observe methods used by local dealer to balance rations. C . Students work on given problems or individual feed problems.	A. Written test to determine if students can solve feeding problems.

Code - 01.010102-01

AGRICULTURAL

Title - FEEDS AND FEEDING

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Selecting feeds to use for livestock Objective 5 Choose to the instructor's satisfaction, feeds to use for a given class of livestock.	A . Factors to consider in selecting feed • Nutritional content • Cost • Feed form as affects utilization and handling • Availability • Palatability • Variety • Bulk
Unit 4 - Determining livestock feeding practices to follow Objective 6 Determine, to the instructor's satisfaction, five practices to follow in feeding a given class of livestock.	A . Recommended feeding practices . Factors to consider • Time • Cost • Returns • Animal Characteristics • Effects of feed on man and animals • Other B. Group Feeding C. Blender mixing wagons
Objective 7 Prepare, to the instructor's satisfaction, a plan for feeding one class of livestock on a given farm.	A . Dairy cattle B . Beef • Description of situation • Types of feeds to be used • Amounts of each feed needed for one year (calculations shall be included) • Estimated costs for one year • Recommended practices that will be followed

01.010102-01 - Code

FEEDS AND FEEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion to provide basic information. B. Field trips . Feed dealer . Farmer who mixes his own feed. . To observe feeds fed to different livestock C. Problem solving preferably of an actual problem	A. Take notes on basic information. B. During field trips take note of the factors considered in feed selection. C. Use problem solving method to solve a given or actual problem.	A . Evaluate student notes to date. B . Written test, based on an actual situation observed during a field trip, to determine feeds to feed.
A. Group discussion to determine factors to consider. B. Field trip(s) to observe practices followed. C. Problem solving method	A. Determine factors to consider in selecting feeding practices. B. Observe and take notes of practices during field trip(s). C. Use problem solving method to solve a given or individual problem during supervised study.	A . Written test involving problems taken from farm situations with different classes of livestock.
A. Supervised Study B. Individual instruction C. Students make oral reports regarding their plans.	A. Prepare plan as instructed B. Use animals owned by students, whenever possible.	A. Evaluate students complete plan. B. Oral reports

Code - 01.010102-01

Title - FEEDS AND FEEDING

OBJECTIVES BY UNIT	CONTENT
Unit 4 Objective 8 Determine how to balance rations that will provide nutrients required for various species of livestock.	A. Dairy . Roughages . Concentrates B. Beef . Roughages . Concentrates C. Poultry . Starter Rations . Growing Rations . Laying Rations D. Swine . Starter Rations . Growing Rations . Fattening Rations

01.010102-01 - Code

FEEDS AND FEEDING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Class discussion C. Problem solving D. Film strips and visuals related to animals fed balanced rations and results from deficient rations E. Field trips	A. Apply knowledge to students Supervised work experience projects. B. Class and field trip notes	A. Field trip report evaluations. B. Written test on problems related to specific types of livestock.

MODULE OF INSTRUCTION

Title - FEEDS AND FEEDING Code - 01.010102-01

RESOURCE MATERIALS

A. Books -

Feeds and Feeding, Morrison (abridged edition for students)
Dairy Cattle Feeding and Management, Reaves and Henderson, Wiley
Stockman's Handbook, Ensminger

B. Bulletins -

"Feeding the Dairy Cow for Maximum Returns" - E1156 - Cornell
"Animal Nutrition Handbook" - Ralston Purina
"Early Cut Hay and Silage" - Cornell #E1059
"Sheep Production" - Cornell #E828
"Raising Beef Cattle" - Cornell #1011
"The Mineral and Vitamin Requirements of Livestock" - Cornell #E 1149
"Lazing Flock Management" - Cornell #E1061

C. Periodicals -

Dairy News - refer to current feed prices sections
Hoards Dairymans
Any of the Livestock Magazines

D. Audiovisuals -

Nasco charts - Animal Digestive Systems

E. Handbooks

Dairy Nutrition - Teachers Handbook - IMS (F33)
Dairy Nutrition - Student's Handbook - IMS (F34)

Total Dairy Ration 'The Whole Thing' in a Single Dairy Feed

by **DR. K. L. DOLGE**
Animal Nutritionist
Feed Division

A popular TV commercial says, "I can't believe I ate the whole thing." Well he did, and dairy cows do, and if dairymen are going to get the most milk for the least money they have got to consider the "whole thing" also—the total dairy ration.

Agway's new TDR (Total Dairy Ration) Profile program does just exactly that. The principle is simple. We know how much dry matter we can reasonably expect a cow to consume. We know how much energy, protein, fiber, etc., she needs to maintain her body weight, grow a calf and support specified levels of production. The TDR program simply combines forage and other homegrown feeds with the proper Agway feed to get the nutritional concentration needed. All it requires is a minimum of paperwork and the answer is in a simple, easy and ready-to-use form.

The beauty of TDR is that it is economical and it works. Dairyman Gary Reardon of McGraw, N.Y., reports a 25-35% increase in production. Austin Warner, an Agway applied research specialist working with the Reardon farm, reports nine cows peaked over 100 lbs/day after going on TDR. While that's exceptional, Dave Hall, a dairyman near Camden, N.Y., increased his herd average 1,100 lbs. by following the TDR recommendations. Glynn O'Hara, the Agway Dairy enterprise salesman who worked with Hall, also got John Pabias, a patron of the Rome, N.Y. store, on TDR. For the first time, cows in the Pabias herd are peaking at 80-90 lbs. and are holding, too.

TDR's Start

TDR originally started as a program limited to herds where facilities for mixing forage and grain and self-feeding the resulting mixture were available. Studies in Georgia and California, as well as at Agway's Research Center in Fabius, N.Y., demonstrated that a *properly balanced* mixture of concentrates and forages could be self-fed. Each cow adjusts intake to meet her individual nutritional requirements. While some dry cows will overconsume and gain excess weight, lactating cows do a good job of adjusting intake to need. The total ration has to be balanced; protein to energy, calcium to phosphorus, and for fiber, bulk and other nutritional factors. When this is done, dry matter can be reliably predicted.

It soon became clear that it really didn't make that much difference whether the farmer mixed the concentrate and forage before feeding or whether the cow mixed them in the rumen after she ate them. The basic principles were the same. For maximum profitable production, nutrient concentration has to be adjusted to total dry matter intake. Too often in the past, requirements were met on paper but the cow couldn't, or wouldn't, eat the amount of forage and concentrate she was alotted. Results were low production and low income. But TDR solves these problems, and may actually lower feed cost, too. For Lawrence Turner and son, Mt. Upton, N.Y., the feed bill is down $600-700 per month since going on TDR. Floyd Tarbell, Dairy Enterprise salesman, reports that in addition to these savings, the Turners' herd average is up 1,500 lbs.

The program is based on established nutrient requirements and dry matter intake. The dairyman supplies the average body weight of the milking herd, the fat test, the price of milk and selects up to four levels of production. The price and nutritive value of his forage and other homegrown feeds is determined either by forage analysis or date of cutting, and the available Agway feeds are entered.

Actually Two Programs

TDR actually supplies two feeding programs. One, "the farm limited," is based on the amount of forage the dairyman is feeding or wants to feed. The second, "the optimum formula," adjusts forage and grain intake to get the nutrient concentration necessary to meet the nutritional requirements within the expected dry matter intake.

A big advantage is that the program prints out the income-over-feed cost for each of the feeding programs. The member can compare either his current forage program, or one he would like to use, to the optimum formula. He can easily see what changes in forage programs will do to that all-important income-over-feed cost figure. This could also be used as a sound basis for decisions on future forage programs. If forage is limited, the program will show how to use it most profitably and whether one should buy hay, or should simply feed more grain.

TDR is versatile. Whether you feed cows in the stanchion, the parlor, or in a bunk; whether you feed grain and forage separately or mixed, TDR can help make more milk for greater income. Edward Henderson of Whitney Point, N.Y., thoroughly agrees. His 115-cow herd, now on TDR, is averaging 48 lbs/day, higher than ever before. Some of his cows are peaking over 95 lbs/day. All are testing exceptionally well and have good persistency.

Like the television commercial, the dairy cow eats the whole thing, so when we feed her, we have to consider that whole thing—the total dairy ration. TDR does that job. ■

MODULE OF INSTRUCTION

Title - PLANNING A BREEDING PROGRAM (LIVESTOCK) Code - 01.010103-01

DESCRIPTION:

Students will develop knowledge and skills required to carry out a successful livestock breeding program. Emphasis will be on the selection and mating of animals to produce a profit. Students will learn how to identify breeding problems and symptoms related to reproductive diseases. The importance of records will be discussed. Students will learn how to keep and use breeding charts.

Artificial insemination of animals will be covered in Dairy Cattle Breeding Module.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Basics of livestock genetics	4	0
2. Basics of livestock reproduction	4	8
3. Livestock reproduction practices	2	7
4. Planning a breeding program	1	4
	11	19

Revised June, 1974

MODULE OF INSTRUCTION

Title - PLANNING A BREEDING PROGRAM Code - 01.010103-01

OBJECTIVES to be obtained:

The student will be able to:

1. Demonstrate knowledge of basic livestock genetics by describing the inheritance of production and other inherited characteristics.
2. Correctly diagram the parts of a male and female reproductive system and list a major function for each part, without the use of references.
3. Correctly determine, by visual means, when an animal is experiencing her heat period.
4. Correctly determine, in a given situation, the time an animal should be bred during the heat period.
5. Correctly recognize the symptoms for five reproductive malfunctions or diseases and list two effective measures that may be taken to prevent each problem.
6. Correctly list five examples of acceptable breeding practices for three different classes of livestock.
7. Demonstrate ability to correctly record information on a reproduction record and use this information to make breeding decisions.
8. Given a situation, correctly select the top three breeding animals from a group of ten.
9. Given a situation, select and justify mates for animals to be bred.
10. Develop a planned breeding program for one class of livestock on a given farm which meets the instructor's approval.

Code - 01.010103-01

Title PLANNING A BREEDING PROGRAM

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Basics of Livestock Genetics Objective 1 Demonstrate knowledge of basic livestock genetics by describing the inheritance of production and other inherited characteristics.	A. Basic Genetics . Laws of inheritance . sex determination . sex - link characteristics . dominant & recessive characteristics . undesirable recessives . lethal genes . mutations B. Other inherited characteristics . Production . Type
Unit 2 - Basics of Livestock Reproduction Objective 2 Correctly diagram the parts of a male and female reproductive system and list a major function for each part, without the use of references.	A. Parts and functions of male reproductive organs Note difference between animals B. Parts and functions of female reproductive organs . Beef . Dairy . Horses . Poultry . Sheep . Swine C. Physiology of conception D. Hormone action as related to the reproductive tract E. Causes of twinning
Objective 3 Correctly determine by visual means when an animal is experiencing her heat period.	A. Reproductive cycles of farm animals B. Indications of heat . Vulva swelling . Behavioral changes . riding . going off feed . restlessness . making noise . Blood and mucous discharges . Production decrease C. Special problems of detecting heat in animals . Dairy . Beef . Horses . Sheep . Swine . Poultry

EDUCATION

01.010103-01 - Code

PLANNING A BREEDING PROGRAM - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class lecture B. Supervised study C. Class discussion D. Film strips and overlays E. Field trip to a farm that has a classified herd	A. Students take notes on lecture, supervised study, class discussion and field trip information. B. Identify herds in the area that will be classified: Observe a classifier at work Discuss the merits of having herds classified with students and cooperative farmers.	A. Written test on basic genetics B. Notebook grade C. Field trip report
A. Supervised study B. Classroom discussion C. Film strips and overlays D. Film on reproduction of farm animals E. Veterinarian, resource person invited to discuss reproductive systems with class members	A. Student notes on supervised study. Class discussion, film strips, overlays and films. B. Students keep diagrams of male and female reproductive tracts. C. Notes on veterinarian comments Ask veterinarian any questions related to problems on the home farm or cooperative farm involved with supervised work experience programs.	A. Written test on reproductive tracts - organs and the function of each organ B. Notebook grade on supervised study class discussion, visual aid material and veterinarian information.
A. Lecture B. Supervised study C. Slides D. Assign students a report related to the objective. Arrange for opportunities to have students make observations on field trips, home farm or cooperative farm.	A. Notes on lecture and supervised study. B. Field trip report oral or written C. Apply knowledge learned to home farm or cooperative farm situations related to supervised work experience programs. D. Discuss the subject with IA inseminators.	A. Performance grade on field trip B. Written test C. Oral test

Code - 01.010103-01

Title - PLANNING A BREEDING PROGRAM

OBJECTIVES BY UNIT	CONTENT
Objective 4 Correctly determine, in a given situation, the time an animal should be bred during the heat period.	A. Egg positions at conception time (ideal) B. Egg position at heat cycle C. Time of fertilization
Unit 3 - Livestock Reproduction Practices Objective 5 Correctly recognize the symptoms for five reproductive malfunctions or diseases and list two effective measures that may be taken to prevent each problem.	A. Reproductive Malfunctions . Hemaphroditism . Freemartins . Cryptorchidism . Cystic ovaries . Retained corpus luteum . Enlarged prostate . Others B. Reproductive diseases . Brucellosis . Leptospirosis . I.B.R.
Objective 6 Correctly list five examples of acceptable breeding practices for three different classes of livestock.	A. Recommend breeding practices . Beef . Dairy . Horses . Poultry . Sheep . Swine
Objective 7 Demonstrate ability to correctly record information on a reproductive record, and use this information to make breeding decisions.	A. Information to record . Identification . Birth date . Parents . Sex . Heat periods . Breeding dates . Pregnancy exam . Veterinary treatment . Date due . Special information B. How to record information C. Using information to make breeding decisions

E D U C A T I O N

01.010103-01 - Code

PLANNING A BREEDING PROGRAM - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - Discussion - supervised study B. Resource personnel or tape recordings C. Local inseminator D. Veterinarian E. Students experiences	A. Take notes on information B. Develop charts for selected animals to show recommended breeding times. C. Use DHIA records and breeding charts to help identify when animals will be in heat	A. Evaluate charts B. Written exam
A. Lecture - discussion to present facts B. Resource personnel to present local situation . Insemination technician . Farmer C. Use tape recordings if possible	A. Take notes on information B. Recognize symptoms of reproductive problems in actual situation. . Using home farm . Cooperative farms . Field trips . Travelwith an inseminator or veterinarian	A. Written test B. Students ability to recognize symptoms under field conditions
A. Supervised study B. Student reporting field trip to area farm	A. Students develop list of breeding practices for selected classes of livestock and report to class. B. Observe practices on farm visit	A. Teacher evaluation of student list of breeding practices. B. Students write a report on breeding practices for given livestock classes.
A. Lecture discussion to present facts B. Supervised study C. Student practice D. Display different forms of breeding charts.	A. Take notes on information B. Develop or obtain records used in various classes of livestock C. Practice filling out records using given information D. Make breeding decisions using given information.	A. Evaluate record forms developed by students B. Work experience evaluation

Code - 01.010103-01

Title - PLANNING A BREEDING PROGRAM

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Objective 8 Given a situation, correctly select the top three breeding animals from a group of ten.	A. Factors to consider in selecting breeding stock . Pedigree . Type . Production B. Other factors . Age . Conformation . Longevity . Cost
Objective 9 Given a situation, select and justify mates for animals to be bred.	A. Mating animals . Laws of inheritance . Factors to consider in mating . correcting weaknesses . increasing production . size , color . conformation . cost
Unit 4 - Planning a Breeding program Objective 10 Develop a planned breeding program for one class of livestock on a given farm which meets the instructor's approval.	A. Program to include . Class of livestock . Current problems . Program to correct problems . Time required B. Resource people available to assist farmers

01.010103-01 - Code

PLANNING A BREEDING PROGRAM - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Field trips for classes of livestock and live selections.	A. Take notes on information B. Evaluate animals from a sale catalog (accompanied by seeing animals if possible) to select male and female breeding stock. C. Group consensus to determine best selection D. Select male breeding stock from artificial insemination company listing.	A. Evaluate students ability to select animals in a farm situation using records and animal classes.
A. Lecture - discussion to present facts B. Supervised study C. A. I. Resource person invited to class to discuss breeding selections	A. Take notes on information B. Practice selecting mates for animals using: . Sale catalogs . On farm visits . Animals from your supervised farming program	A. Evaluate students ability to mate animals on a farm visit, or from a catalog. B. Select mates for animals listed in sale catalogs.
A. Individual instruction B. Supervised study C. Speaker - a successful breeder of livestock in your area or: . Members from site selections committees . A. I. Field staff . A. I. organization field staff . Pro-genetics	A. Prepare breeding programs plan for your own farm, cooperative farm or sample farm.	A. Given a specific farm situation students evaluate plan.

MODULE OF INSTRUCTION

Title - Planning a Breeding Program Code - 01.010103-01

RESOURCE MATERIALS

Books:

1. Livestock Breeding - 194 pages, Ohio available from IMS
2. Anatomy & Physiology of Farm Animals-Frandson-Lea & Febiger
3. Reproduction in Farm Animals-Hafez-Lea & Febiger
4. Principles of Genetics-Gardner-Wiley
5. Breeding & Improvement of Farm Animals, 6th ed., Rice, McGraw-Hill
6. Artificial Insemination of Farm Animals,Perry-Rutgers Press

Bulletins:

1. Artificial Insemination of Livestock - 8 pgs., Illinois, available from IMS
2. Sterility and Delayed Breeding in Dairy Cattle - Cornell E737
3. Sheep Production - Cornell E828
4. Raising Beef Cattle - Cornell E1011
5. Selection and Evaluation of Dairy Sires, E 1118
6. Horse Health Hints - E 1153
7. N. Y. Swine Improvement Program - E 1206
8. Estimating Transmitting Ability of Sires - Cornell 1217
9. Laying Flock Management - Cornell E 1061
10. Reproduction of Farm Animals (Cornell bulletin out of print)

Periodicals:

1. Artificial Insemination (monthly) - National Assn. of Animal Breeders
2. Breed Assn. Magazines

Audiovisuals:

1. Dairy Cattle Sterility - (45 color slides) available from IMS
2. Genetics & Livestock Breeding Transparencies - Cal. Poly Tech
3. Models, filmstrips, transparencies - NASCO
4. Livestock Breeding Transparencies & Master - 37 transparencies - IMS

MODULE OF INSTRUCTION

Title - MAINTAINING LIVESTOCK HEALTH Code - 01.010105-01

DESCRIPTION:

The prevention of animal disease is emphasized in this module. Students will develop skills in recognizing animal stress, maintaining sanitary housing and using health records to prevent disease problems.

Students will be involved in the recognition of symptoms of diseases that are common to production livestock (beef, dairy, horses, sheep, swine). The appropriate action following the diagnosis of a disease requiring veterinary service, quarantine, and emergency treatment are also covered.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Recognizing Disease Symptoms	1	2
2. Treating Livestock Diseases	2	9
3. Prevention of Livestock Diseases	4	12
	7	23

Revised January, 1975

MODULE OF INSTRUCTION

Title - MAINTAINING LIVESTOCK HEALTH

Code - 01.010105-01

OBJECTIVES to be obtained:

The student will be able to:

1. Define a disease.
2. Select and use references on animal diseases.
3. Demonstrate a working knowledge of the causes, symptoms and treatment or control of fifteen livestock diseases common to the area.
4. Determine when a veterinarian should be called to treat livestock.
5. List ten common preventative vaccinations or inoculations used to control animal diseases and indicate the uses of each.
6. List ten important sanitation measures used for control and prevention of animal diseases.
7. Demonstrate their ability to recognize environmental situations causing stress on livestock.
8. Demonstrate the ability to correctly use and analyze health records to prevent disease problems.
9. Prepare a planned program for maintaining high health standards for one class of livestock on a given farm or specific situation.

Code - 01.010105-01

Title - MAINTAINING LIVESTOCK HEALTH

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Recognizing Disease Symptoms Objective 1 Define a disease.	A. Definition of an animal disease
Objective 2 Select and use references on animal diseases.	A. Select available references on animal diseases. B. Make a list of references on animal diseases.
Unit 2 - Treating Livestock Diseases Objective 3 Demonstrate a working knowledge of the causes, symptoms and treatment or control of fifteen livestock diseases common to the area.	A. Animal diseases common to the area. Discuss causes, symptoms, treatment and control of diseases. Examples: Dairy milk fever ketosis displaced abomasum cow pox Beef eye cancer prolapse navel ill Horses colic founder Monday morning disease bots equineencephalomyelitis Sheep enterotoxemia (over eating disease) white muscle disease coccidiosis blue tongue Swine cholera anemia atropic rhinites influenza General bloat scouring parasites (external, internal) pinkeye foot rot pneumonia reproductive diseases tuberculosis shipping fever rabies poisioning

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher lecture B. Slides showing diseased animals	A. Students will check references and discuss definitions of animal diseases B. The class will arrive at a definition	A. Written test
A. Supervised study period	A. Students will find available references and develop a list of animal disease references for class use.	A. Instructor will check list.
A. Veterinarian speak to the class on common diseases in area. B. Field trips to area farms to determine diseases common to area. C. Individual supervised study. D. Student reporting	A. Students should take notes for notebooks and future references. B. Field trip reports. C. Students should identify the major livestock diseases on their own farms and community.	A. Written test on common diseases. B. Oral test on common diseases. C. Field trip report evaluation by instructor D. Notebook grade evaluation by instructor.

Code - 01.010105-01

Title - MAINTAINING LIVESTOCK HEALTH

<table>
<tr><th>OBJECTIVES BY UNIT</th><th>CONTENT</th></tr>
<tr><td>Objective 4
Determine when a veterinarian should be called to treat livestock.</td><td>A. Factors to consider when calling a veterinarian.
. How sick is the animal?
. temperature
. pulse
. alertness
. breathing rate
B. Can the animal be treated properly by farm personnel?
. Correct diagnosis of the problem
. Are proper medications available?
. Do you have the expertise to handle the problem?</td></tr>
<tr><td>Unit 3 - Prevention of Livestock Diseases
Objective 5
List ten common preventative vaccinations or inoculations used to control animal diseases and indicate the uses of each.</td><td>A. Types of vaccinations and inoculations
. Active immunity
. Passive immunity
B. Vaccinations and inoculations available (examples below) and their uses
<table>
<tr><th>Dairy & Beef</th><th>Horses</th><th>Sheep</th></tr>
<tr><td>BVD vaccine</td><td>distemper vaccine</td><td>CCSN bacterim</td></tr>
<tr><td>TB vaccine</td><td>encephalomyelitis vaccine</td><td>lamb-vax</td></tr>
<tr><td>brucellosis</td><td></td><td></td></tr>
<tr><td>IBR</td><td></td><td></td></tr>
</table>
<table>
<tr><th>Swine</th><th>General</th></tr>
<tr><td>anti-hog cholera serum</td><td>wart vaccine</td></tr>
<tr><td>erysipelas vaccine</td><td>shipping fever</td></tr>
<tr><td>influenza vaccine</td><td>IBR vaccine</td></tr>
<tr><td></td><td>sepospirosis</td></tr>
<tr><td></td><td>tri-sulfa injectable</td></tr>
<tr><td></td><td>tetanus toxoid</td></tr>
</table>
C. Proper use of vaccinations and inoculations</td></tr>
<tr><td>Objective 6
List 10 important sanitation measures used for control and prevention of animal diseases.</td><td>A. Proper sanitation measures to control diseases of livestock as in references such as "the 10 commandments of animal health" in the Pfizer Animal Health Handbook
B. Initiating sanitation measures on farms
. Value to farmer in reducing disease
. Cost of sanitation measures
. Time involved</td></tr>
</table>

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and class discussion B. Farm visits to determine how farmers handle herd health problems.	A. Read sections that apply to specific diseases in Animal Health Handbooks. B. Given specific symptoms and conditions have students react to specific problems and explain how they would handle the situation.	A. Written test on lecture notes and field trip information. B. Oral examinations regarding specific livestock problems.
A. Resource Personnel . Local veterinarian can tell the class what preventative vaccinations he uses. . Biological products salesman can tell the class what he has available. B. Farm visits to determine what farmers are using. C. Class discussion to determine what is used on their farms. D. Individual study and class reporting.	A. During resource personnel visits, farm visits and class time students will be compiling a list of vaccinations used, how common they are, their effectiveness and their purpose. B. Individual supervised study on selected vaccinations and class reports on findings.	A. Written test B. Evaluate students notes C. Evaluate students report in terms of completeness and effective use of references.
A. Individual supervised study to determine measures for different classes of livestock. B. Group discussion C. Field trips to observe farm practices.	A. Students will determine effective sanitation measures for selected classes of livestock during individual supervised study. B. Group discussion and field trips to determine current use of practices. C. Students will compile information in notebooks during visits and sessions.	A. Written test B. Evaluation of notes C. Evaluation of student ability to use references.

OBJECTIVES BY UNIT	CONTENT
Objective 7 Demonstrate their ability to recognize environmental situations causing stress on livestock.	A. Definition of stress from Pfizer or other references B. Types of stress on livestock C. Effects of stress on livestock D. Recognizing and preventing livestock stress
Objective 8 Students will demonstrate their ability to correctly use and analyze health records to prevent disease problems.	A. Information needed in health record for each class of livestock. B. How to use livestock health records. C. How to analyze health records to prevent disease problems.
Objective 9 Prepare a planned program for maintaining high health standards for one class of livestock, on a given farm, or specific situation.	A. The plan should include . History of past years animal health . Description of current situation . Description of factors causing health problems . Plan for maintaining livestock health

E D U C A T I O N

01.010105-01 - Code

MAINTAINING LIVESTOCK HEALTH - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture--discussion	A. Take notes during lecture discussion	A. Test students ability to recognize stress situation during a planned farm visit.
B. Field trips to find stress conditions on farms	B. Determine conditions causing stress during farm visits	B. Have students write suggestions for alleviating the stress situations.
	C. Determine means of alleviating stress conditions and report orally to class.	
A. Lecture--demonstrations showing types of records in use and information on them.	A. Students will develop lists of information needed on health records.	A. Have students solve a given problem which requires analysis of a health record.
B. Individual supervised study having students develop records for selected livestock.	B. Students will develop health record forms to be used for one class of livestock which they choose.	B. Evaluate students notes on sample record forms.
C. Class problem solving--solve given problems on records in class to illustrate record use and analysis.	C. Students will fill in records with information given by the instructor and then analyze the information to determine what steps could be taken to prevent disease problems.	
D. Field trip to observe types of health records in use by farmers.		
A. Students will prepare a planned health program for their farms or situation.	A. Have the students health program plan reviewed by the local veterinarian and parents. If satisfactory start implementing the health program on the local farm.	A. Evaluation of writte health program.
B. Oral report including questions regarding the report from class members and instructor.		B. Evaluation of oral report.
		C. Allow credit for implementation of program as a result of supervised work experience on the home farm or cooperative farm.

MODULE OF INSTRUCTION

Title - MAINTAINING LIVESTOCK HEALTH Code - 01.010105-01

RESOURCE MATERIALS

Books

1. Animal Health Handbook. Pfizer, 1965
2. Agriculture In Our Lives. Krebs, Interstate
3. Dairy Science. Petersen, Lippincott
4. Feeds and Feeding. Morrison, Morrison Pub. Co.
5. 1956 Yearbook of Agriculture-Animal Diseases
6. Infectious Diseases of Domestic Animals. Iowa State University
7. Veterinary Guide for Farmers. Hawthorne

Bulletins

1. A Dairy Herd Health Program. Dairy herd disease control committee of N. Y. State Veterinary Medical Society
2. Dairy Herd Management. Bulletin 998, Bradt
3. Programmed Dairy Herd Health. Smith D.V.M., Canton Ag. & Tech.
4. Feeding the Dairy Cow for Maximum Returns. Cornell Ext. Bull. 1156, Slack et.al.
5. Anchor Veterinary Handbook. latest edition
6. Sheep Production. Cornell Bulletin E828
7. Raising Beef Cattle. Cornell Bulletin E1011
8. Horse Health Hints. Cornell Bulletin E1153

MODULE OF INSTRUCTION

Title - LIVESTOCK HOUSING

Code - 01.01010602-01

DESCRIPTION:

Selection of housing will be evaluated for specific types of livestock based on temperature, space requirements, and location of facilities.

Using skills developed, the selection of a housing design for a given animal production enterprise will depend on efficient use of labor, ease of mechanizing operations and initial cost of structure.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Planning Livestock Housing Facilities	2	2
2. Housing Requirements for Various Types of Livestock	4	2
3. Types of Livestock Housing Available	6	14
	12	18

Revised June, 1974

MODULE OF INSTRUCTION

Title - LIVESTOCK HOUSING

Code - 01.01010602-01

OBJECTIVES to be obtained:

The student will be able to:

1. List five factors that should be considered when planning livestock housing facilities.

2. Calculate temperature, space and ventilation requirements for beef cattle, dairy cattle, swine, sheep, horses and poultry.

3. List the main sources of information on livestock housing.

4. List the advantages and limitations of the types of livestock housing.

5. List 14 factors that should be considered when selecting livestock housing.

6. Select and justify, in terms of the factors that should be considered when selecting livestock housing, an appropriate type of housing facility for a specific situation.

Code - 01.01010602-01

Title - LIVESTOCK HOUSING

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Planning Livestock Housing Facilities Objective 1 List five factors that should be considered when planning livestock housing facilities.	A. Factors that should be considered when planning livestock housing facilities are: . Type of livestock enterprise . Climatic conditions . Soil conditions . Drainage . Accessability to the farmstead complex . Zoning regulations B. Indicate the importance of adequate livestock housing
Unit 2 - Housing Requirements for Various Types of Livestock Objective 2 Calculate temperature, space and ventilation requirements for beef cattle, dairy cattle, swine, sheep, horses and poultry.	A. Temperature and Ventilation Requirements for: . Dairy . Beef . Swine . Sheep . Poultry . Horses B. Space Requirements for: . Dairy . Beef . Swine . Sheep . Poultry . Horses
Unit 3 - Types of Livestock Housing Available Objective 3 List the main sources of information on livestock housing	A. Land grant colleges and extension service . Cornell University Extension . Iowa State University . Penn State University . University of Illinois B. Agri-Business Industry . Agway Incorporated . Ralston Purina Company . Surge Dairy Systems C. United States Department of Agriculture D. Local Farmer

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study period. Assign students questions that will be discussed. C. Class discussion D. Invite a number of the village, town or county planning board to discuss zoning regulations.	A. The student will relate the home farm or cooperative farm and report on the housing facilities. B. Prepare a report that would list the strengths and weaknesses of the housing facilities. Indicate the factors that were not used in planning the livestock housing facilities.	A. Written report on assignment B. Oral quiz on content C. Written quiz on planning factors and the importance of adequate livestock housing.
A. Supervised study B. Class discussion C. Field trip to local farms	A. Make notations of highlights of field trips. B. List the temperature, ventilation and space requirements for a specific livestock enterprise in notebooks.	A. Notebook grade B. Field trip report grade
A. Class discussion B. Supervised study. Review schools references C. Field trips to farms and agri-business facilities	A. List sources of references in notebook. B. Complete field trip reports using format attached to this module	A. Notebook grade B. Field trip grade C. Oral examination

Code - 01.01010602-01

Title - LIVESTOCK HOUSING

OBJECTIVES BY UNIT	CONTENT
Objective 4 List the advantages and limitations of the types of livestock housing.	A. Dairy . Conventional . Loose housing . Free-stall system B. Beef . Warm confinement . Cold confinement C. Poultry . Brooder houses . solar type . pole type . Laying houses . cage type . solar type . pole type . tilt-up concrete type . pre-fab buildings D. Sheep . Sheds . Lambing quarters E. Swine . Movable hog houses . Permanent houses . farrowing houses . farrowing nursery units . finishing units F. Horses . Horse barn (saddle) . Stall type

E D U C A T I O N

01.01010602-01 - Code

LIVESTOCK HOUSING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study on each type of livestock housing for each type of enterprise. B. Class discussion and use of reflective thought process to organize ideas concerning each type of housing available. C. Field trip to: . Dairy farm using conventional barn system . Dairy using loose housing system . Beef farm . Horse farm . Sheep, swine and poultry operation	A. Prepare a list of the different types of housing available for each type of enterprise studied. List the advantages and limitations of each. B. Prepare and complete outline sheet for each field trip.	A. Written test. The student can list and describe at least two types of housing used for each livestock enterprise studied. B. Evaluate field trip reports. C. Oral quiz on field trip highlights.

Code - 01.01010602-01

Title - LIVESTOCK HOUSING

OBJECTIVES BY UNIT	CONTENT
Objective 5 List 14 factors that should be considered when selecting livestock housing.	A. Factors to consider in selecting livestock housing . Climate . section of country . weather . Type of livestock to be housed . Number of livestock to be housed . Present facility available . Advantages and limitations of different types of housing . Local, state and federal regulations . building permit . zoning . drainage, floor, windows, etc. . Location on farm site . drainage . protection from wind . convenience to farm dwelling . accessability to machinery . convenience to other out buildings . accessability to cropland, roads, lanes . Cost of modification of old structure . Cost of new structure . Versatility for use with other enterprises . Future plans for changes in enterprises . Resources available . Management ability
Objective 6 Select and justify in terms of the factors that should be considered when selecting livestock housing, an appropriate type of housing facility for a specific situation.	A. Dairy . 125 head operation B. Dairy . 60 head operation C. Beef . 125 brood cows . 200 feeder steers D. Poultry . 100,000 bird unit . 60,000 bird unit . 30,000 bird unit

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study	A. List in notebooks, factors which can be found in references.	A. Written test
B. Show films and slides on livestock housing	B. Discussion of factors found in films and slides	B. Oral test
C. Panel discussion	C. Discussion groups formed to each consider and prepare five factors to be presented in a panel discussion (one of each group sits on the panel)	C. Notebook grade
D. Guest speaker (town official) to present and discuss local, state and federal regulations which are pertinent to livestock housing.	D. Question the guest speaker	
E. Guest speaker (extension specialist) Topic: Location of livestock housing on the farm site	E. Question the guest speaker	
A. Supervised classroom activities solving problems pertaining to livestock housing. . Dairy . Beef . Poultry . Other	A. Using notebooks containing all previously discussed information students will solve four problems related to livestock housing.	A. Given a livestock situation and using references and notebooks, have students determine housing requirements for specific livestock enterprises
	B. Students will work at problems related to the home farm or cooperative farm.	
	C. Work with sample forms solving specific housing problems.	

Field Trip Outline #2
Types of Livestock Housing

1. Write the name of the type of livestock housing system visited.

   ____

2. Fill in the blanks pertaining to this business.

   a. Total size of this particular housing system ______________

   b. Space dimensions per animal ______________

   c. Number of animals housed ______________

   d. Condition of animals ______________

   e. Cost of structure ______________

   f. List any particular problems discovered.

3. List at least one change you would make in this livestock housing unit.

Field Trip Outline #1

Beginning of field trip

1. List two types of reference information you expect to procure.

   1. ______________________________

   2. ______________________________

2. Write the name of the organization visited and the name and position of the man who conducted the tour, for further reference.

3. List the specific references made available to you pertaining to livestock housing.

   1. ______________________________

   2. ______________________________

   3. ______________________________

   4. ______________________________

   5. ______________________________

4. List new ideas you acquired and should discuss in class.

(Circle one)

5. Evaluation of field trip
   a. Information pertinent to our problem - Yes or No

   b. The guide was interesting - Yes or No

   c. The guide answered all of my questions - Yes or No

MODULE OF INSTRUCTION

Title - LIVESTOCK HOUSING   Code - 01.01010602-01

RESOURCE MATERIALS

Books: (teacher references)
1. Profitable Farm Management - pp 119-120, Hamilton & Bryant, Prentice Hall, Inc.
2. Plans of Farm Buildings for N.E. States - U.S.D.A. Misc. Pub. #278

(student references)
1. Beef Housing and Equipment Handbook - Ref. #1, Midwest Plan Service, Iowa State University
2. Dairy Equipment Plans and Housing Needs - Ref. #3, Midwest Plan Service, Iowa State University
3. Handbook for Dairymen - Ref. #4, pp 4 & 7, A. Coletti, Iowa State University Press
4. Swine Management Handbook, Ref. #8, Penn. State Pub. #U Ed. 9-202

Bulletins: (teacher references)
1. Dairy Automation - Agway
2. Ventilate Your Dairy Stable - C. N. Turner, Cornell Ext. Bull. #845
3. Ventilating Insulated Dairy Buildings - Cornell Misc. Bull. #84
4. Appraising Farm Buildings - Vo-Ag Service, Univ. of Illinois

(student references)
1. Ref. #2 Cornell Agric. Engineering Ext. Bulletin #851-B
2. Ref. #5 Cornell Agric. Ext. Bulletin #1159
3. Ref. #6 Costs and Performance Characteristics of Free Stall Housing System - Trattel & Loomis, Cornell A.E. Res. #243
4. Ref. #7 Stalls for Barns for the Dairy Herd, Cornell Misc. Bull. #60
5. Ref. #9 Agric. Engineering Ext. Bulletin #851-L
6. Ref. #10 Agric. Engineering Ext. Bulletin #851-P
7. Ref. #11 Purina Nest Egg Factory, Ralston Purina Co.
8. Ref. #12 Purina Triple Deck Cage Egg Factory, Ralston Purina Co.
9. Ref. #13 Purina Cage Pullet House, Ralston Purina Co.
10. Ref. #14 Ventilation for Poultry Houses - Cornell Ext. Bulletin #1140

Audiovisuals:
1. 16 mm film - Dynamic Dairying - 16 min., Farm Film Corporation
2. 16 mm film - Modern Livestock Systems - 16 min., U.S.Steel Corp.

MODULE OF INSTRUCTION

Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

Code - 01.01010699-01

DESCRIPTION:

Students enrolled in this module will be involved in the selection and replacement of livestock. The students will be working with procedures in judging and selecting livestock for longevity, conformation and productive ability. Considerable time will be spent on laboratory type exercises.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Breeds of dairy cattle	1	2
2. Breeds of beef cattle	1	2
3. Registration of cattle	1	2
4. Livestock selection	1	8
5. Methods of selection	½	3
6. Fitting and showing of cattle	1	5
7. Classification of dairy cattle	½	2
	6	24

Revised January, 1975

MODULE OF INSTRUCTION

Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

Code - 01.01010699-01

OBJECTIVES to be obtained:

The student will be able to:

1. List from memory the breed and origin of each of the five major breeds of dairy cattle.
2. List from memory the breed and origin of at least six breeds of beef cattle.
3. Compose to the instructors satisfaction and send a letter requesting information concerning cattle pedigree and registration to at least one breed association.
4. Correctly complete a breed registration application form.
5. Identify from memory at least 25 parts of a cow.
6. List 10 of the 12 factors to be considered when selecting foundation or replacement stock.
7. List from memory the categories of the dairy and the beef judging score cards including the value given to each category.
8. Compute a score for a given class of livestock using a Hormel scoring slide.
9. Judge with accuracy of 75% or better four classes of dairy and two classes of beef cattle.
10. List the advantages and disadvantages of selecting and purchasing foundation or replacement stock at local livestock markets, disposal sales, private sales and syndicate buying.
11. Given the age, production records, health records and a visual observance of five animals, select two animals which could be used as foundation animals or replacement stock and determine the sales value of each.
12. Properly groom an animal and show an animal to its best advantage in the show ring.
13. List four advantages of having a herd classified.

Code - 01.01010699-01

Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Breeds of dairy cattle Objective 1 The student will list from memory the breed and origin of each of the five major breeds of dairy cattle.	A. Breeds of dairy cattle . Ayrshire - Scotland . Brown Swiss-Switzerland . Guernsey-British Isles, Isle of Guernsey . Holstein-Holland . Jersey-British Isles, Isle of Jersey . Black Belted-Canada . Others
Unit 2 - Breeds of beef cattle Objective 2 The student will list from memory the breed and origin of at least six breeds of beef cattle	A. Breeds of beef cattle . Aberdeen Angus-Scotland . Hereford -British Isles . Brahman -India . Charolais -France . Shorthorn -British Isles . Red Angus -U.S. . Santa Gertruda-U.S. . Cross breeds . Polled Hereford . Polled Shorthorn
Objective 3 The student will compose to the instructors satisfaction and send a letter requesting information concerning cattle pedigree and registration to at least one breed association.	A. Provide students with names and addresses of breed associations. B. Review the reasons for and uses of pedigrees. C. Provide students with basic letter format.

E D U C A T I O N

01.01010699-01 - Code

SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Slides of examples of each different breed. C. Field trip to farms having as many of the major breeds as possible. D. Use available magazines	A. Individual student research to discover origin of each breed. B. Make a chart showing the following information for each breed of dairy cattle. . Breed and picture of animal . Breed magazine name . Origin . Date of first importation . Average mature weight . Average birth weight . Average amount of milk produced . Average % butterfat produced . Average yearly gross income	A. Written test B. Oral test Name the breed and origin of the five major breeds of dairy cattle.
A. Supervised study B. Slides of examples of each breed C. Field trips to farms having beef breeds	A. Individual student will research to discover origin of each breed. B. Make a chart showing the following information for each breed . Breed and picture of animal . Origin . Date of importation . Average mature weight . Average birth weight . Average weaning weight	A. Written test B. Oral test Name the breed and origin of six major breeds of beef cattle
A. Lecture B. Supervised study period C. Use pedigree samples. Illustrate how to complete and evaluate a pedigree.	A. Note taking B. Students can review pedigrees of cattle on the home farm C. Write a letter to a breed association requesting information about requirements for registration.	A. Notebook grade B. Evaluation of students letter to a breed association

Code - 01.01010699-01

Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Registration of cattle Objective 4 Correctly complete a breed registration application form.	A. Registration forms for various breeds B. Drawing or picture of each side C. Notations of markings D. Breeding and service dates E. Prefix, naming of animal F. Signatures
Unit 4 - Livestock selection Objective 5 Identify from memory at least 25 parts of the cow.	A. Parts of a dairy animal B. Parts of a beef animal
Objective 6 List 10 of the 12 factors to be considered when selecting foundation or replacement stock.	A. Factors to consider . Purebred or grades . Selection of breed . Size of herd . Uniformity . Health . Condition . Age and longevity . Reproductive ability . Milking ability . Size . Adaptation . Price

EDUCATION

SELECTION, REGISTRATION, FITTING AND SHOWING - itle
OF FOUNDATION AND REPLACEMENT STOCK

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study using sample registrations B. Have students actually complete registration forms.	A. Practical practice of filling out an application for registry using the true type model cow and dates and information supplied by the instructor. B. Review the home farm or cooperative farms cattle registrations.	A. Instructors evaluation of applications submitted by students.
A. Lecture B. Using judging scorecard, naming and pointing out the parts of dairy and beef animals C. Use a slide showing cow with parts labeled.	A. Note taking B. Label the parts in their proper places on the drawing of a cow.	A. Written test B. Given the name of the parts of a cow the student will locate at least 25 on drawing of the animal.
A. Lecture B. Student discussion C. The judging manual D. Film--"Animal Wonders" Guernsey Cattle Club Peterboro, N. H.	A. Note taking B. Listing of factors to conside in selection C. Panel discussion . Registered US grade cattle and/or . Holsteins vs colored breeds	A. Test--oral or writte B. Name 10 factors to be considered when selecting foundation or replacement stock. C. Teacher evaluation of panel discussion.

OBJECTIVES BY UNIT	CONTENT
Objective 7 List from memory the categories of he dairy and beef judging score cards including the value given to each category.	A. Categories of the dairy judging scorecard . General appearance - 30 . Dairy character - 20 . Body capacity - 20 . Mammary system - 30 Total 100 pts. B. Categories of the beef judging scorecard--varies with breed . Conformation . Natural fleshing . Breed and sex characteristics . Constitution . Feet legs and bone
Objective 8 Compute a score for a given class of livestock using a Hormel scoring slide.	A. Step by step procedure in computation of a placed class.
Objective 9 Judge with accuracy of 75% or better four classes of dairy and two classes of beef cattle.	A. Classification of livestock judging techniques . Consistency . Classifications . general appearance . dairy or beef character B. Show ring classes . Calf classes . Cow classes . Group classes

EDUCATION

01.01010699-01 - Code

SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture	A. Notes on reasons and evaluation of each of the categories on the dairy scorecards.	A. Written and oral test Name the categories and their point evaluation found on the dairy judging scorecard.
B. Using scorecards review the major categories and the weight of each category listed on the official breed scorecards C. Slides showing dairy and beef breed animals	B. Notes on reasons and evaluation of each category on the beef scorecards	B. Written and oral test Name the categories used in judging beef
A. Demonstrate the use of the Hormel scoring slide	A. Practice using the Hormel scoring slide	A. Provide information required for scoring classes of livestock. Grade students on these exercises.
A. Lecture (short) B. Slides and tape of dairy judging Cornell Slides by Hartman C. Demonstration of judging on the farm D. Field trips to show herds E. Beef cattle judging slides - IMS F. Beef cattle judging handbook-IMS	A. Note taking B. Class discussion C. Practice judging-field trips D. Enter Hoard's dairyman Dairy Judging Contest E. Students could compete at sub district, district and state FFA sponsored dairy judging contests.	A. Given two classes of dairy and two classes of beef cattle the student will place the animals and receive a score for a grade on the exercise.

Code - 01.0101699-01

Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Methods of Selection Objective 10 List the advantages and disadvantages of selecting and purchasing foundation or replacement stock at local livestock markets, dispersal sales, private sales and syndicate buying.	A. Methods of purchasing and pricing cattle . Private sale . Public sale . Livestock auction . Syndicate buying
Objective 11 Given the age, production records, health records, and a visual observation of five animals, select two animals which could be used as foundation animals or replacement stock and determine the sales value of each.	A. Practical experience in judging and selection, using live animals and pictures of dairy and beef animals.
Unit 6 - Fitting & showing of cattle Objective 12 Properly groom an animal and show an animal to its best advantages in the show ring.	A. Grooming equipment . Fitting procedures . clipping . washing . blanketing . grooming B. Showmanship . Training animal . Leading techniques . Posing techniques . Show ring procedures
Objective 13 List four advantages of having a herd classified.	A. Classification scorecard . Scorecard breakdown B. The benefits of classification . Corrective breeding . Improve longevity . Improve type . Improve production

MODULE OF INSTRUCTION

Title - Management of Young Dairy and Beef Code - 01.01010699-02

DESCRIPTION:

Students enrolled in this module will be primarily involved with the care of newborn and young cattle. A special emphasis will be placed on housing facilities, health and feeding. Other involvements include the skills of dehorning, castration, removal of extra teats, hoof trimming, clipping for show. The recognition of heat and parturition will be covered.

MAJOR DIVISIONS OR UNITS OF CONTENT		Time Allocations Class	Time Allocations Other
1.	Care and Handling of Calves at Birth	2	3
2.	The Housing Needs of Calves	1	3
3.	Feeds and Feeding Practices of Calves to 6 Months of Age.	2	4
4.	Special Health Management Practices	1	3
5.	Feeding and Management of Youngstock from 2 Months to Freshening	2	9
		8	22

Revised **August** '75

MODULE OF INSTRUCTION

Title - Management of Young Dairy and Beef   Code - 01.01010699-02

OBJECTIVES to be obtained:
The student will be able to:

1. List the essentials of an adequate calving area so **the calf can be** born safely and under conditions that can enhance its survival.
2. **List the five most prominent signs of the oncoming of** parturition in cattle.
3. List the eight steps to follow in caring for a newborn calf, immediately following birth.
4. Recognize to the **instructor's** satisfaction four symptoms indicating digestive disorders in **newborn calves during the weaning and growing periods.**
5. Determine the basic housing needs essential for calves and recognize the advantages and disadvantages of the various housing facilities.
6. List six essentials of a good housing sanitation program.
7. List four requirements of hay used for calves, and three necessary **ingredients of concentrates used in a calf feed program.**
8. Outline on paper a calf feeding program ranging from birth to the age of six months.
9. **Use a weight measuring tape and** demonstrate his ability to estimate the weight of an animal to the instructors satisfaction.
10. Demonstrate his ability to dehorn a calf, electrically, remove extra teats, using surgical scissors, and trim an animals feet.
11. List the causes, symptoms, and controls of at least seven different calf diseases and four heifer diseases.
12. Outline on paper a heifer feeding program from six months of age to freshening.
13. Recognize the various types of housing for heifers and evaluate each method.
14. Determine when to breed heifers according to size, age and season and be able to list three symptoms and the length of time for each part of the heat cycle.
15. **Prepare a heifer for freshening.**

Co - 01.01010699-02

Title - Management of Young Dairy and Beef

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Care and Handling of Calves at Birth Objective 1 List the essentials of an adequate calving area so the calf can be born safely and under conditions that can enhance its survival.	A. **Calving areas** .Box stall .Old horse stall .Yard near barn - summer
Objective 2 List the five most prominent signs of the oncoming of parturition in cattle.	A. **Parturition signs** .Dropping of abdomen .Sunken area around pins .Swollen and red vulva .Mucous discharge .Restlessness .Fullness of udder, teats distended .Standing up and lying down continuously
Objective 3 List the eight steps to follow in caring for a **newborn** calf, immediately following birth.	A. **Breathing** . Nasal mucous . Stimulation . Artificial respiration B. **Cleaning and drying** C. **Navel cord treatment** D. **Assistance in nursing** E. **Quarters** . Clean . Dry . Draft free

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Include inspection of calving areas when on calf housing field trips. B. Supervised study period C. Lecture D. Classroom discussion	A. Note taking on field trips and classroom work. B. Discussion of individual students calving areas on home farm or employers farm. C. Students develop their own system of caring and handling calves at birth.	A. Test - Written on the ideal calving area. B. Evaluate student reports.
A. Lecture B. Arrange for a field trip to observe a cow giving birth.	A. Note taking on discussion and lecture B. Involve student in actual on-the-farm observation	A. Test orally or written. Name five most prominent signs of the oncoming of parturition in cattle.
A. Lecture B. Supervised study C. Students discuss procedures used on the home farm regarding the caring of a newborn calf.	A. Notes listing steps to be taken. B. Involve student in actual calf delivery on the home farm or cooperative farm.	A. Test orally or written. Name eight steps to follow in caring for the newborn calf, immediately following birth.

Code - 01.01010699-02

Title - Management of Young Dairy and Beef

OBJECTIVES BY UNIT	CONTENT
Objective 4 Recognize to the instructor's satisfaction four symptoms indicating digestive disorders in newborn calves during the weaning and growing periods.	A. Off-feed B. Unthriftiness C. Low temperature D. Loose bowel E. Tight bowel F. Bloating
Unit 2 - The Housing Needs of Calves Objective 5 Determine the basic housing needs essential for calves and recognize the advantages and disadvantages of the various housing facilities.	A. Housing types . Boxstalls 30-50 sq ft per calf 50-150 sq ft per heifer . Slatted floor stalls - 1 calf each . Tied in free area B. Essentials of housing area . Draft free . Dry . Adequate water . Hay rack . Grain box
Objective 6 List six essentials of a good housing sanitation program	A. Sanitation . Discard old litter and feed from stall . Allow the stall to dry . Disinfect floor, walls, ceiling . Disinfect all utensils to be used by calf . Allow stall to air and dry for at least 2 days . Place clean dry bedding in the stall . Clean stall weekly B. Management . Keep housing clean . Ventilation

01.01010699-02 Code

Management of Young Dairy and - Title
Beef

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study period B. Field trip to a farm having many calves C. Slide presentation showing digestive disorder symptoms.	A. Students write a report relating to digestive disorders of calves on the home farm.	A. Written test on symptoms of digestive disorders.
A. Lecture B. Field trips to calf housing facilities of various structure and systems. C. Discussion	A. Blueprint a design of adequate calf housing structure for individual calf or a group system for calves. B. Construct an individual calf pen in shop	A. Test - list the advantages of a housing system that you would prefer for your own use. B. Oral quiz on essentials of basic calf housing requirements.
A. Movie on calf rearing B. Field trip to a local farm to inspect desirable housing facilities.	A. Note taking B. Discussion of sanitary precautions taken on home farm or employer's farm.	A. Test - written or orally name six essentials of a housing sanitation program

Code - 01.01010699-02

Title - Management of Young Dairy and Beef

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Feeds and Feeding Practices of Calves to Six Months of Age Objective 7 List four requirements of hay used for calves, and three necessary ingredients of concentrates used in a calf feeding program.	A. Hay . Green . Leafy . Palatable . Early-cut, early June B. Concentrates . Calf starter . antibiotic . high in protein . palatability . mineral content
Objective 8 Outline, on paper a calf feeding program ranging from birth to the age of six months.	A. Feeding schedules for dairy and beef calves . The digestive tract . Milk feeding requirements . Using milk replacer . Limited milk feeding and dry calf starter . Nurse cow method . Skim milk method . Sour colostrum method B. Water C. Hay D. Antibiotics E. Vitamins F. Minerals G. Silage H. Pasture
Objective 9 Use a weight measuring tape, and demonstrate his ability to estimate the weight of an animal to the instructor's satisfaction.	A. Tape . Weight in ratio to inches . Orientation to area of heart girth . Tension on the tape . Record information

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study . Let students bring calf . starter tags into class C. Bring roughage samples to class. Discuss the quality of roughages. Set up a lab exercise so that students could actually handle, and rank.	A. List feeding requirements of calves from birth to six months of age. Apply this knowledge by actually following approved recommendations in feeding calves used for students' supervised work experience programs.	A. Test - oral or written. State four requirements of hay, and three requirements of concentrates. B. Grade student on calf project performance.
A. Supervised study B. Film strip on raising dairy calves C. Speaker, local farmer, or calf grower.	A. Procure information concerning feeding programs for calves. B. Panel discussion - Feeding whole milk vs. milk replacers. C. Students select a calf feeding program, discuss the advantages of the program.	A. A written test on feeding program content. B. Grade student's report on his feeding program method.
A. Demonstration B. Supervised practice C. Field trip, have all students tape animals and record the data.	A. Practice practical application of content on the home farm and in supervised work experience programs. B. Use tapes to estimate body weight of animals on the home farm.	A. Oral evaluation B. Performance grade on field trip exercises.

Code - 01.01010699-02

Title - Management of Young Dairy and Beef

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Special Health Management Practices Objective 10 Demonstrate his ability to dehorn a calf electrically, remove extra teats, using surgical scissors, and trim an animal's feet.	A. Dehorning B. Removing extra teats C. Care of the feet. . Trim feet
Objective 11 List the causes, symptoms, and controls of at least seven different calf diseases and four heifer diseases.	A. Prevention and symptoms of calf diseases . Scours - common and white . Pneumonia . Ringworm and mange . Lice . Cattle grubs . Internal parasites . Tuberculosis B. Symptoms and diseases of older heifer 6 months to calving . Mange . Warts . Ringworm . Tuberculosis . Brucellosis C. Controls of diseases and parasites . Vaccination . Sanitation . Preventative herd health
Unit 5 - Feeding & Management of Young Stock from 2 Months to Freshening Objective 12 Outline on paper a heifer feeding program from 2 months of age to freshening.	A. Feeding schedule for dairy heifer . Winter feeding-hay, silage and concentrates . Feeding heifers on pasture . Water and minerals B. Feeding schedules for beef heifer . Roughages . Concentrates
Objective 13 Recognize the various types of housing for heifers and evaluate each method.	A. Housing for heifers . Stanchions and exercise yard . Pen stabling . Free stall

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Field trip for demonstrations C. Speakers-veterinarian or taped interview of key farmers.	A. Practice practical application of content. B. Dehorning . Teat removal . Trimming of feet	A. Instructor's evaluation, performance grade. B. Written test on Objective 10 content.
A. Supervised study of diseases and parasites B. Veterinarian invited to the classroom for lecture and discussion. C. Film on common calf diseases.	A. Using references the student will seek and write the causes, symptoms, and control of diseases studied. B. Involve students in disease control on the home farm or employers farm.	A. Written test on causes, symptoms, and control of seven calfhood and four diseases of older heifers.
A. Lecture B. Supervised study C. Movie-Heifer Management	A. Develop a feeding program for heifers on the home farm or cooperative farm.	A. Test - oral or written of heifer feeding program. B. Test on key words related to the objective content.
A. Lecture B. Field trip to observe various heifer housing arrangements. C. Panel discussion Free stall vs. Stanchions	A. Design a heifer housing arrangement.	A. Instructor's evaluation of heifer housing design.

OBJECTIVES BY UNIT	CONTENT
Objective 14 Determine when to breed heifers according to size, age and season and be able to list three symptoms and the length of time for each part of the heat cycle.	A. When to Breed Heifers . Size . Age . Season B. Symptoms and Length of Heat Cycle . Approaching heat . Standing heat . Terminating heat
Objective 15 Prepare a heifer for freshening	**A. Proper conditioning of heifer** •Time and feed involved **B. Training heifer to adjust to** •Milking parlor •Stanchion

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Mimeo handout made up by the teacher (acquired through Eastern breeders) B. Problem solving technique Slide and tape set from University of Wisconsin Raising dairy calves and heifers C. Lecture and class discussion	A. Students can apply knowledge acquired in determining breeding ages of heifers on the home farm or cooperative farm.	A. Test-written complete a heat cycle. List heat symptoms and determine the best time for breeding heifers.
A. Lecture B. Class discussion	A. Note taking on lecture and discussion period.	A. Test-oral or written on procedures used to properly condition a heifer for freshening.

MODULE OF INSTRUCTION

Title - Management of Young Dairy and Beef　　Code - 01.01010699-02

RESOURCE MATERIALS

Books

Diggins & Bundy. Dairy Production. 2nd. ed. Prentice-Hall, Englewood Cliffs, N.J.
1. Cattlemans Handbook, Interstate
2. Sanitation and Disease Control, Interstate
3. Feeds and Feeding Abridged by Morrison, Interstate
4. Animal Science by Ensminger, Interstate

Bulletins

1. Raising dairy calves and heifers. Cornell Ext. Bulletin 76
2. 4-H Bulletins - Calf Raising. Agric. Ed.
3. Agway
   Purina
   Wayne
   Beacon
   Other food companies

   These companies are known to prepare bulletins which may be procured from local feed dealers.
4. IMS, Stone Hall, Cornell Univ., Ithaca, N. Y.
   Dairy Cattle Feeding (F30, F 31)
   Dairy Nutrition (F34, F 35)

Periodicals

Hoards Dairymen Magazine
Farm Journal Magazine
Successful Farming Magazine
Breed Association Magazines or Journals
Feed company news
American Agriculturalist
American Stockman

Audiovisuals

Movie Calf Rearing - Purina Feeds, Ralston Purina Co., Checkerboard Square
St. Louis, Mo.
Wayne Feeds
Filmstrip and record
Calf rearing
Heifer magazine
Slides 0.3 Raising Dairy Calves - Cornell Film Library

MODULE OF INSTRUCTION

Title - RAISING DAIRY BEEF

Code - 01.01010699-03

DESCRIPTION:

The student will be involved with developing the skills needed for the starting, growing, and finishing and marketing of dairy beef for human consumption.

Emphasis will be placed on breed selection for maximum growth, feeding, castrating, inoculating the calf, feeding and finishing the steer.

Special, feed and housing requirements will also be determined.

MAJOR DIVISIONS OR UNITS OR CONTENT	Time Allocations	
	Class	Other
1. Selecting, feeding and housing	4	6
2. Health	2	3
3. Growing	4	6
4. Finishing and marketing	2	3
	12	18

Revised June '75

MODULE OF INSTRUCTION

Title - RAISING DAIRY BEEF

Code - 01.01010699-03

OBJECTIVES to be obtained:

The student will be able to:

1. State four reasons why the largest dairy breeds are selected to be raised for beef, and systematically select the breed preferred by the student. Substantiate this answer with four reasons.
2. Outline a feeding program, to the instructor's satisfaction, which could be used in raising calves from birth to six weeks of age.
3. List seven requirements to consider when preparing a housing facility for growing dairy beef calves from birth to six weeks.
4. Identify the causes, symptoms and controls of calf diseases.
5. Demonstrate the ability to detect diseases, involving at least three symptoms each for the two stress diseases.
6. Demonstrate the ability to administer injections, use a Balling gun, take and record temperature readings.
7. Outline to the instructor's satisfaction, a health program which could be implemented for dairy beef calves for the period from birth to six weeks of age.
8. Demonstrate the ability to castrate, dehorn, and trim hooves, on young animals.
9. Identify at least ten diseases, and their symptoms, common to dairy beef animals from six weeks of age to finish.
10. Outline a feeding program for dairy beef from age six weeks to finish.
11. Select 10 requirements of housing, and lot facilities required for growing dairy beef steers six weeks to finish.
12. Name the proper feeding techniques to be used in finishing Dairy Beef.
13. Locate five facilities available for marketing Dairy Beef.

Code -- 01.01010699-03

Title - RAISING DAIRY BEEF

AGRICULTURAL

OBJECTIVES BY UNIT

Unit 1 - Selection, Feeding, and Housing

Objective 1

State four reasons why the larger dairy breeds are selected to be raised for beef, and systematically select the breed preferred by the student. Substantiate this answer with four reasons.

CONTENT

A. Dairy Breeds

	Weight in lbs.	
	Birth	Maturity
.Holstein	100-110	16-1800 lb.
.Brown Swiss	100+	14-1600 lb.
.Ayrshire	90-100	12-1400 lb.
.Guernsey	85-90	1000-1300 lb.
.Jersey	60-80	1200 lb.

B. Beef Breeds

.Angus)
.Hereford) Birth wt. in Guernsey-Jersey range
.Shorthorn)
.Brahman
.Charolois

C. Other Factors

.Availability and cost
.Time period involved - Birth to 1 year
.Weight gain 100-1000 lbs.
.% Dressability
.Feed consumption (total cost)
.Feed/profit ratio

MODULE OF INSTRUCTION

Title - SNAP BEAN PRODUCTION

Code - 01.01020107-02

DESCRIPTION:

This is a study of the vegetable industry and the problems involved in snap bean production. Laboratory periods will include practical experience in the cultural operation of growing and harvesting vegetable crops.

Laboratory experiences involve cost accounting procedure specific to vegetable crops. Adjustment and maintenance of field equipment specific to vegetable crops will be covered.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Costs and returns on vegetable crops	2	2
2. Processor's contract provisions	2	0
3. Selecting a suitable field	1	2
4. Fertilizing snap beans	1	2
5. Planting and chemical weed controls	1	4
6. Insect and disease controls	2	2
7. Cultivation	2	2
8. Harvesting and delivering	1	4
	12	18

Revised June, 1974

MODULE OF INSTRUCTION

Title - SNAP BEAN PRODUCTION

Code - 01.01020107-02

OBJECTIVES to be obtained:

The student will be able to:

1. List the factors affecting costs and returns of the crop.
2. Complete a cost account record on a given crop enterprise.
3. List the major provisions of a processor's contract.
4. Identify the factors of field conditions that limit the field's suitability to snap bean production.
5. Select the most economical analysis and amount of fertilizer for the crop.
6. Identify weeds, insects and diseases common to a given crop in the area.
7. List the controls for the insects and diseases common to the crop in a given area.
8. Identify profitable cultivation practices for the crop.
9. Have an awareness of the operation of mechanical harvesting and handling equipment including delivery trucks.

Code -- 01.01020107-02

Title - SNAP BEAN PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Costs and returns on vegetable crops Objective 1 List the factors affecting costs and returns of the crop.	A. Costs . Growing . land . fertilizer . sprays and dust . seed . labor . tractor . other equipment . interest . cover crop . other costs . Harvesting . labor . tractor . trucking . custom harvesting . other . Storing and selling B. Returns C. Other factors . costs to grow a ton . costs to harvest a ton . costs to store and sell a ton . net cost per ton . return per ton
Objective 2 Complete a cost account record on a given crop enterprise	A. Cost account records . Expenses . Income B. Calculate profit or loss
Unit 2 - Processor's Contract Provisions Objective 3 List the major provisions of a processor's contract	A. Planting dates B. Grades C. Methods of grading D. Methods of payment E. Variety of seed F. Field man supervision

01.01020107-02 - Code

EDUCATION

SNAP BEAN PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study B. Lecture C. Resource person, field personnel from processor or chain store buyer. D. Calculate cost and returns using enterprise records	A. Students can check cost items for producing the crop and prices for produce at marketing time. B. Take notes on supervised study questions, lecture and guest speakers.	A. Written test on crop production costs including the affect of yields and unit prices on total profit.
A. Supervised study period using sample cost account records showing vegetable enterprise accounting. B. Class discussion regarding input costs, market prices, yields per acre and how these factors influence profit or loss. C. Invite vegetable producer to discuss the business with students in class or on a field trip.	A. Notes on sample account records, class discussion and field trip. B. Students could develop costs and returns for a vegetable project as a part of their supervised work experience program.	A. Notebook grade B. Written quiz on cost account problem for a snap bean enterprise.
A. Class lecture on processor requirements B. Class discussion on grower and processor responsibilities C. Review contracts D. Invite field personnel to discuss production and harvesting problems.	A. Notes on class lecture, discussion and field personnel information	A. Oral exam on contract provisions B. Note book grade

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Selecting a suitable field Objective 4 Identify the factors of field conditions that limit the fields suitability to snap bean production	A. Soil . Type . Drainage . Fertility B. Adaptability to mechanical planting, culture practices and harvesting C. Limiting factors
Unit 4 - Fertilizing snap beans Objective 5 Select the most economical analysis and amount of fertilizer for the crop.	A. Soil test . Determine soil fertility level . Select correct fertilizer B. Determine fertilizer application methods . Broadcast . Band . Sidedress
Unit 5 - Planting and chemical weed controls Objective 6 Identify weeds, insects and diseases common to a given crop in the area.	A. Preparing the seedbed . Plowing . Fitting B. Planting the crop . Selecting row width . Planter calibration C. Selection and application of herbicides and insecticides D. Selecting disease resistant varieties.

EDUCATION

01.01020107-02 - Code

SNAP BEAN PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study period B. Class lecture and discussion C. Slides D. Field trip	A. Notes on class lecture, discussion and slides. B. Field trip report on selecting suitable fields for snap bean production.	A. Written exam on objective content.
A. Supervised study B. Lecture and discussion C. Slides on proper fertilization and deficiencies	A. Notes on supervised study. . Lecture and discussion B. Students lab on soil testing and fertilizer .Recommendations for a given soil and crop C. Adjust and calibrate fertilizer equipment.	A. Written exam on soil testing procedures, fertilizer analysis, rates and application methods. B. Test on unknown soil samples, lab project. C. Performance grade on adjustment and calibration of equipment.
A. Supervised study B. Lecture C. Class discussion	A. Land lab project for FFA crop demonstration B. Students visit snap bean growers in the area to discuss crop problems. Take notes on the field trip. C. Collect weeds, insects and diseased plants for a classroom display.	A. Written exam B. Field trip report C. Evaluate display of weeds, insects and diseased plants.

Code - 01.01020107-02

Title - SNAP BEAN PRODUCTION

OBJECTIVES BY UNIT	**CONTENT**
Unit 6 - Insect and disease controls Objective 7 List the controls for the insects and diseases common to the crop in a given area.	A. Insect identification . Life cycles . Mexican bean beetle . leaf hoppers . aphids . mites . root worms B. Diseases and controls . leaf spot . fungus . blight . anthracnose . mosaic . dry root rot
Unit 7 - Cultivation Objective 8 Identify profitable cultivation practices for the crop	A. Cultivation . Control weeds . Prevent moisture loss B. Methods of cultivation . Time . Depth
Unit 8 - Harvesting and Delivering Objective 9 Have an awareness of the operation of mechanical harvesting and handling equipment including delivery trucks.	A. Custom hire vs own harvester B. Mechanical ladders C. Trucking . Body Requirements . Scheduling

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Insect charts C. Disease charts D. Slides	A. Notes on lecture, insect and disease identifications. B. Students can visit farms during growing season to observe crops, identify insects and diseases affecting the crop. Make recommendations regarding the controls.	A. Written exam B. Field trip report
A. Lecture B. Field trip C. Slides	A. Notes on lecture, field trip report and slides	A. Written or oral test
A. Supervised study B. Class lecture C. Chalk and board D. Slides	A. Notes on supervised study, class lecture and slides.	A. Written or oral test.

MODULE OF INSTRUCTION

Title - SNAP BEAN PRODUCTION

Code - 01.01020107-02

RESOURCE MATERIALS

Periodicals:

1. The Planter-Selection, Adjustment, Maintenance and Use - UAS 3021. Urbana, Illinois : Vocational Agricultural Service, University of Illinois, 1967, 40 pages.
2. Agricultural Marketing Principles - Columbus, Ohio : Ohio Agricultural Education Curriculum Materials Service, The Ohio State University. 1972, pp 1-20.

Bulletins:

1. Common Insects of Vegetables, C.E.B. 1035
2. Vegetable Diseases, C.E.B. 1034
3. Field Crops Cost and Returns Ag Econ. Res. Yearly
4. Cost and Returns on Snap Beans Production, Ag. Econ. Res. Yearly
5. Cornell Recommends for Veg Crops, yearly
6. Farm Management Handbook, Ag Econ. Ext 440 yearly

MODULE OF INSTRUCTION

Title - PLANT DISEASE CONTROL   Code - 01.010208-01

DESCRIPTION:

A definite portion of plant science must be devoted to the plant, its susceptibility to diseases, and the control of these diseases. In order to maintain plant health and economic stability in raising crops, one must understand the methods of efficient control of these diseases.

The student studying this module will be involved with identifying the causes and symptoms, as well as the controlling of disease in plants which are common to production agriculture.

Emphasis will be placed upon identification of disease symptoms, and relating these to the causal organisms. Safety in the use of chemical controls, and the machinery involved will also be emphasized.

Much of the laboratory time will be devoted to gathering and analyzing specimens and using machinery.

DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Identification and control	1	23
2. Safe use of machinery and chemicals	0	6
	1	29

Revised August 1975

635

MODULE OF INSTRUCTION

Title - PLANT AND DISEASE CONTROL Code - 01.010208-01

OBJECTIVES to be obtained:

The student will be able to:

1. Write to the instructors satisfaction, a working definition of the word disease, in reference to plants. Develop a plan that will demonstrate how plant diseases affect crop yields and profits.

2. Collect and identify specimens of eight diseases of cereal grain crops..

3. Collect and identify specimens of four row crop plant diseases.

4. Collect and identify specimens of ten diseases of pasture (forage) crops.

5. Collect and identify specimens of ten vegetable crop diseases.

6. Develop a preventative program for one disease in each of objectives 2, 3, 4, and 5.

7. Select the proper chemical control method for each of the diseases selected in objective 6.

8. List and demonstrate 15 precautions to use when working with disease control chemicals.

9. Calibrate to the instructors satisfaction, a sprayer which will be used to apply a disease control chemical.

Code - 01.010208-01

AGRICULTURAL

Title - PLANT DISEASE CONTROL

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identification and Control Objective 1 Write to the instructors satisfaction, a working definition of the word disease, in reference to plants. Develop a plan that will demonstrate how plant diseases affect crop yields and profits	A. Definition (possible) Infectious or non-infectious occurrences which cause damage and death to plants and economic loss to the grower. These occurrences are the results of the presence of a susceptible host, a pathogenic organism, good organism distribution, and proper environment. Infection may occur and a disease become established only when all phases are complete. B. Causes - Fungi, Bacteria, Viruses, Nematodes
Objective 2 Collect and identify specimens of eight diseases of cereal grain crops.	. Dwarf bunt - winter wheat . Common bunt - winter wheat . Mildew - barley . Leaf scald - barley . Smut - barley . Stem rust - oats . Crown rust - oats . Black stem - oats . See IMS Sheets. Forage Crops - Disease and Insect Sheet (FFA Contest)
Objective 3 Collect and identify specimens of four row crop plant diseases.	- Corn - the main row crop, N.Y.S. . Yellow leaf blight . Southern corn leaf blight . Maize dwarf mosaic . Smut . Anthracnose - beans . Bean blight . Mosaic - beans . Potato scab . Potato blight - late . Potato blight - early

01.010208-01 - Code

PLANT DISEASE CONTROL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study . Vegetable diseases . Southern corn leaf blight . Open door to plenty C. Discussion Disease vs. crop yields control cost vs. - returns	A. Note Taking List all points concerning diseases discussed in each reference. B. Discuss material discovered. C. Write the definition of a plant disease.	Teacher evaluation of written definition.
A. Supervised study Cornell recommends for field crops B. Show examples of diseases as demonstration. Use - slides pictures - specimen - riker mounts.	A. List from the references the diseases of cereals B. Collect specimens of each disease and compare it with a healthy specimen - store in solution on mount. C. Use pictures if necessary.	Written test to identify the diseases - Use IMS sheets - . Forage crop insects and diseases . Vegetable crop insect and disease sheet.
A. Supervised study - Cornell recommends. B. Supervised collection while on a field trip.	A. List from reference the corn diseases available (row crop of N.Y.S.) B. Collect specimens of diseases and compare with healthy one.	Teacher evaluation of collection for identification.

Code - 01.010208-01

AGRICULTURAL

Title - PLANT DISEASE CONTROL

OBJECTIVES BY UNIT	CONTENT
Objective 4 Collect and identify specimens of ten diseases of pasture (forage) crops.	Pasture Diseases . Ground stripe) . Anthracnose) . Powdery mildew) most grasses . Ergot . Rust . Smuts . Purple leaf spots) orchard grass . Scald) . Brown spot) . Bacterial blight) Broomegrass . Eye spot - timothy . Net Blotch - Fescues . Leaf spot) bluegrasses . Leaf blotch) . Bacterial wilt) . Leaf spot) alfalfa . Downey mildew)
Objective 5 Collect and identify specimens of ten vegetable crop diseases.	Diseases . Asparagus Rust . Anthracnose) . Bact. Blight) . Mosaic) Beans . Dry root rot) . Downey mildew) . Black spot - beets . Wirestem) . Blight) . Black leg) Cabbage, cauliflower, broccoli . Fisaricum yellows) . Clubroot . Tip burn Root knot nematode . Black - heart - celery . Scab - cucurbits Many others
Objective 6 Develop a preventative program for one disease in each of objectives 2, 3. 4, and 5.	Disease selection and research

01.010208-01 - Code

PLANT DISEASE CONTROL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study . Cornell recommends for field crops . Approved practices in pasture management B. Discussion C. Field trip - supervised collection of specimens	A. List the diseases as discovered in references B. Discuss diseases and their appearances. C. Collect specimens and mount or preserve in liquid D. Identify each using references	Teacher evaluation of preservation and identification.
A. Supervised study using references . Vegetable Diseases - 1034 . Cornell recommends for vegetable crops. B. Field trip to truck farms C. Guest speaker - Extension agent spec. in vegetable crops.	A. Compile a list of diseases from references, speakers, and farmers involved. B. Gather specimens and preserve in cellophane or jars. Identify specimens.	Evaluation of identification and preservation of specimens.
A. Supervised study . Assist students in selection of diseases. . Let students list method of prevention of selected diseases . Organize students and assist in preparing reports on one disease.	A. Using references as in other objectives develop a prevention program for diseases selected. B. Orally, report on one of these.	Teacher evaluation of the program presented.

Code - 01.010208-01

Title - PLANT DISEASE CONTROL

OBJECTIVES BY UNIT	CONTENT
Unit 1 Objective 7 Select the proper chemical control method for each of the diseases selected in objective 6.	Disease selection and research • Chemical • Physical - (crop rotation) Buy certified Seed.
Unit 2 Safe use of machinery and chemicals. Objective 8 List and demonstrate 15 precautions to use when working with disease control chemicals.	Categories . Tractor operation . Calibration of equipment (residual effect) . Clothing . Labeling . Storage
Objective 9 Calibrate to the instructors satisfaction, a sprayer which will be used to apply a disease control chemical.	Fumigation Spray equipment . Hand operated - small . Machine operated - large . Aerial application

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A Supervised study using references as in objectives 2, 3, 4, and 5 B Panel discussion - Mechanical vs. chemical control (select three students on each part) C Class discussion - lead around similarities of different controls.	A Select and record the chemical methods suggested for use on selected diseases. B Panel discussion on uses of controls. C Prepare one similarity and one difference between methods of control for different plants.	Teacher evaluation of methods of chemical control prepared.
A Supervised study using film on Agric. Chem. Safety B Review in discussion safe tractor operation.	A. Record in notebook the precautions to be used when using chemicals. B. Prepare a list of safe tractor operation rules, to be reviewed by instructor.	Oral or written exam .15 precautions when using agricultural chemicals
A. Demonstration of use of each type by custom operator, or farmer who uses this equipment. B. Prepare a worksheet of steps to be used in operation C, Supervised practice . Teacher to assemble samples of poisons from chemical salesmen or stores. Empty containers with directions acceptable. D. Get prices - discuss costs - number of applications - etc. E. Demonstrate mixing of fungicide -	A Observation of demonstrations B Question any poorly understood parts. C Complete the worksheet D Make a list of chemicals shown - note physical characteristics in notebook. E Identify chemical with disease it will control. F Study - labels on containers note dilutions G Learn to pronounce names - and spelling.	A. Teacher evaluation of student operation B. Collect worksheets and evaluate C. Written or oral exam on names of chemicals and identifying diseases these chemicals should be used to control. D. Write a plan for controlling five plant diseases on your farm this summer.

MODULE OF INSTRUCTION

Title - PLANT DISEASE CONTROL   Code - 01.010208-01

RESOURCE MATERIALS

Books - "Approved Practices in Pasture Mgt."
- Interstate, McVickar & McVickar

Bulletins - Southern Corn Leaf Blight
Voc. Agric. Service - College of Agric., Univ. Ill. @ Urbana Champaign
Cornell Ext. Bull. 1130, N.Y.S. College of Agric.
Cornell Ext. Bull. 1034, N.Y. S. College of Agric.
Cornell Recommends for Field Crops, N.Y.S. College of Agric.
Open Door to Plenty - Nat. Agric. Chem. Assn.
1145, 19th St. N.W., Wash. 6, D.C.
Cornell Misc. Bull - 74 - N.Y. S. College of Agric.
Cornell Misc. Bull - 59 - N.Y. S. College of Agric.
IMS Sheets - Forage Crop - Veg. Crop Insect and Diseases (FFA Contest Forms)

Periodicals - Cornell Ext. Bull. 1130 - N.Y.S. College of Agric.
(also many other available from Mail inc.)
Cornell Ext. Bull. 1034 - Veg. Diseases
Cornell Recommends for Field Crops - N.Y.S. College Agric.

Audio-Visuals - Agric. Chem. Safety - Filmstrip and study guide -
VEP. Calif. State, Poly. College, San Luis Obispo, Calif. 93401

MODULE OF INSTRUCTION

Title - PLANT INSECT PEST CONTROL Code - 01.010208-02

DESCRIPTION:

Insects are an important part of our world's life cycle. They are usually classified as useful and harmful types, depending upon their use to man. If insects could carry on their life cycles unmolested, they would maintain their own natural equilibrium. The foods required by various insects range from decaying meats, blood and fecal matter, and other insects to plants. Their herbacious diets are of prime importance to man because of the great demand of foods used for human consumption. Many humans feel they cannot afford to sacrifice a portion of their food for the welfare of insect life. They, therefore, attack insects through the use of poisons called insecticides.

Students studying this module will be involved with the insect problems of their area, the means by which insects eat, and methods available for controlling the insects classified as pests.

Emphasis will be placed upon the recognition of insects, their means of feeding, and the methods used in controlling their populations and food consumption. The student will be involved with the use of insecticides and their applications. He will also be required to collect and identify specimens.

DIVISIONS OR UNITS OF CONTENT		Time Allocation Class	 Other
1.	Identifying Insects	1	6
2.	Life Cycles of Insects	0	2
3.	Feeding Methods of Insects	1	11
4.	Controlling Insects	0	9
		2	28

Revised 4/75

MODULE OF INSTRUCTION

Title - PLANT INSECT PEST CONTROL Code - 01.010208-02

OBJECTIVES to be obtained:

The student will be able to:

1. Make a list of no fewer than twenty-five insects found in the area, and segregate those which have been designated as destructful to crops. Develop an understanding of how insects affect crop yields and profits.
2. Recognize and identify the sections of the insect body, biting types, and sucking types of mouths, and the eye, antenna, wings, and legs of a given insect.
3. Identify through the use of a key, and pictures, five of the insects found harmful.
4. Draw and label the life cycles of the five insects used in objective 3 and three useful insects, of the student's choice.
5. Draw and label the chewing type mouth, and list ten insects which are of the chewing type.
6. Draw and label the sucking type mouth, and list ten insects which are of the sucking type.
7. Properly place eight of ten given insects into the proper category of chewing or sucking insects with use of a hand lens.
8. Collect and identify (with common names) 20 different insects. Collection may be pictures or drawings where live specimens can not be located.
9. List, step by step, the control method used for each of five destructive insects.
10. Develop a preventative program for the control of infestation of each of the insects in objective 9.
11. Select the proper chemical and time to control each of the insects in objective 9.
12. List and demonstrate 15 precautions to use when working with insecticides.
13. Calibrate, to the instructor's satisfaction a sprayer which will be used to apply an insecticide.
14. Develop a plan for controlling five insects on your farm this summer.

Code - 01.010208-02

A G R I C U L T U R A L

Title - PLANT INSECT PEST CONTROL

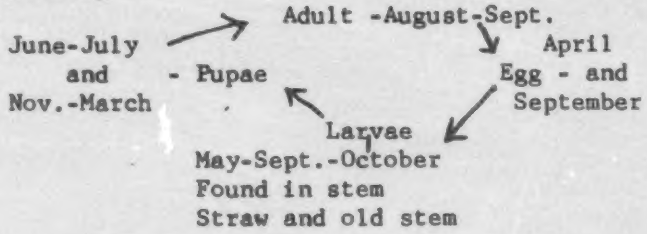
OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identifying Insects Objective 1 - Make a list of no fewer than twenty-five insects found in the area, and segregate those which have been designated as destructive to crops. Develop an understanding of how insects affect crop yields and profits.	A. IMS Cornell • List of Vegetable Crop Insects • List of Forage Insects (These sheets used in State Fair FFA Contests)
Objective 2 - Recognize and identify the sections of the insect body, biting types, and sucking types of mouths, and the eye, antenna, wings, and legs of a given insect.	A. Body parts .Head .Thorax .Abdomen .Compound eye .Antenna .Front leg .Middle leg .Hind leg .Mouth
Objective 3 - Identify through the use of a key, and pictures, five of the insects found harmful.	A. Insects harmful to crops . Japanese beetle . Southern root worm . European corn borer . Wire worm . Cut worm . Leaf hopper . Many others - see two IMS Sheets used at State Fair - F.F.A. Competition

EDUCATION

01.010208-02 - Code

Plant Insect Pest Control - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture-Importance of Insect Control Supervised study	Using IMS Sheets check off insects known to be a problem on your farm.	Teacher evaluation of compiled list - each pupil checks off.
Lecture Supervised study	List body parts in notebook Draw and label an insect's body	Test Label the parts of the body when presented with a drawing of an insect.
Guest Speaker Coop. Extension specialist in Entomology Supervised study	Select and cut out pictures of examples of insects causing destruction to crops. Note for record information discussed by speakers. Use opaque projector to identify pictures. Handle riker mounts and specimen in groups. Encourage individual study.	**Identification quiz** - either pictures or actual specimen Use IMS - Sheets for quiz. Set up IMS Forage Crops Ident. Contest - on Vegetable Crop - Insect Ident. Contest Sheet

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Life Cycles of Insects Objective 4 Draw and label the life cycles of the five insects used in objective 3 and three useful insects, of the student's choice.	Ex. of one Hessian Fly  Adult -August-Sept. April Egg - and September Larvae May-Sept.-October Found in stem Straw and old stem June-July and Nov.-March - Pupae
Unit 3 - Feeding Methods of Insects Objective 5 Draw and label the chewing type mouth, and list ten insects which are of the chewing type.	. Clypeus . Labrum . Epipharynx . Hypopharynx . Mandibles . Maxillas . Maxilary palp . Labium . Palpifer . Galea
Objective 6 Draw and label the sucking type mouth, and list ten insects which are of the sucking type.	. Maxillary palp . Labrum . Epipharynx . Mandible . Labella . Hypopharynx . Labium . Salivary duct . Food channel

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Supervised Study Explain periods of life cycles and over-wintering	Draw label and file life-cycles of the insects being considered	Teacher evaluation of drawings and labels
Lecture Supervised study of the mouth using hand lens and real examples	. Draw and label the chewing type of insect mouth . Identify with hand lens each part labeled	Teacher evaluation of drawings, labels and lists Evaluate students ability to recognize parts of real insect
Supervised study of the mouth using hand lens and real example	. Draw and label the sucking type of insect mouth . Identify with hand lens each part labeled	Teacher evaluation of drawing, labels, and lists Evaluate students ability to recognize parts on a real insect

OBJECTIVES BY UNIT	CONTENT
Objective 7 Properly place eight of ten given insects into the proper category of chewing or sucking insects with use of a hand lens.	. Ten insects selected by instructor . Five chewing type mouth . Five sucking type mouth
Objective 8 Collect and identify (with common names) 20 different insects. Collection may be pictures or drawings where live specimens cannot be located.	Needed - . net . Cyanide bottle (kill jar) . pins . Cigar box . Mothballs
Unit 4 -Controlling Insects Objective 9 List step by step, the control method used for each of five destructive insects.	A. Physical controls B. Chemical controls C. Different feeding habits of sucking type and chewing type insects.
Objective 10 Develop a preventative program for the control of infestation of each of the insects in objective 9.	A. State of life cycle easiest to combat B. Determination of easiest method of prevention C. Success of previous uses D. Time to apply prevention

EDUCATION 01.010208-02 - Code

PLANT INSECT PEST CONTROL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Supervised **study** Laboratory exercise	Use notes from previous objectives to practice differentiation of the two mouth types.	Test Recognize and categorize eight of the ten given insects for mouth types.
Field trip and supervised study capture, killing and mounting through thorax Supervised identification	Capture and mount 20 different insects from field trip and on students own time Name each specimen	Teacher evaluation of specimen collection
Field trip to farms using insect controls. Supervised study	Select five destructive insects and list the methods of control which may be used on each.	Teacher evaluation of lists compiled by students.
Guest Speaker from a chemical company selling insecticides (specialist) Supervised study	Outline a program for the prevention of insect infestation for the five insects in objective 9. Make a list of chemicals shown Tell if chemical is used as a dust - a liquid - or - granule. Identify - chemicals with insects it will control. Study label on container - become familiar with nature of chemical. Note - dilutions on directions.	Teacher evaluation of the outline. Written test on different chemicals which can be used to control five insects. Check on students knowledge - of dilution procedures.

Code - 01.010208-02

Title - PLANT INSECT PEST CONTROL

OBJECTIVES BY UNIT	CONTENT
Objective 11 Select the proper chemical and time to control each of the insects in objective 9.	. Eating habits of insect . Time of year . Stage of life cycle . Degree of infestation . Chemicals available
Objective 12. List and demonstrate 15 precautions to use when working with insecticides.	Categories A. Tractor operation B. Calibration of equipment (residual effect) C. Clothing D. Labeling E. Storage
Objective 13 Calibrate, to the instructor's satisfaction a sprayer which will be used to apply an insecticide.	. Fumigation . Aerial equipment . Spray equipment . Fogging Equipment
Objective 14 Develop a plan for controlling five insects on your farm this summer.	.Insecticides available .dilution charts .directions on package .choice of sprayer and sprayer tips.

01.010208-02 - Code

PLANT INSECT PEST CONTROL - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Supervised study	List the insect and note the proper time, stage of life cycle and chemical control advised to use.	Teacher evaluation of control method and list.
Supervised study **Demonstration using equipment** to apply **insecticides** Laboratory **exercises** Review discussion, safe tractor operation.	. Record in notebook the precautions to be used when using chemicals. . Prepare a list of safe tractor operation rules to be reviewed by instructor.	Oral or written exam 15 precautions when using **agricultural** **chemicals.**
A. Demonstration of use of each type by custom spray operator, or farmer who uses this equipment B. Prepare a worksheet of steps to be used in operation C. Demonstration by teacher - Calibrate sprayer - note PSI-nozzles gallons/acre. D. Show samples of at least 10 insecticides. Demonstrate how each is used. E. Stress safety during demonstrations using chemicals.	Observation of demonstration Question any poorly understood parts. Complete the worksheet on **calibration.** Make list of 10 insecticides with insect and crop related to each.	Written exam on **calibration** of chemicals. Teacher evaluation of student operation Collect worksheets and evaluate.
Problem solving Prepare problems common to area.	Determine how much insecticide to use with a gallon of water on **given acres of a specific crop to cover** a specific insect.	Write a plan for controlling five insects on your farm this summer.

MODULE OF INSTRUCTION

Title - PLANT INSECT PEST CONTROL   Code - 01.010208-02

RESOURCE MATERIALS

Books - Destructive and Useful Insects, Metcalf and Flint, McGraw-Hill

Bulletins:
1. How to choose and use your farm sprayer, Hansen Equip. Co., Beloit, Wis.
2. Cornell Ext. Bull. 206, The control of diseases and insects affecting vegetable crops
3. Cornell Ext. Bull. 1082, Disease and insect control in the home orchard
4. Cornell Ext. Bull. 1035, Common insects of vegetables
5. U.S.D.A. Bull. 2040, Control of potato insects
6. Cornell Recommends for field crops and vegetable crops
7. Agric. Chems. - Pesticides, Curric. Materials, Ag. Ed. ETV 1-7 Virginia Poly. Inst., Blacksburg, Va.
8. Agric. Chem. Safety, VEP, California State Poly. College, San Luis Obispo, California 93401
9. G 12 - I.M.S. Cornell University, Stone Hall
10. Corn Insects - Vocational Agriculture Service
    University Illinois - Urbana, Illinois
11. Know Your Insects 4-H Members Guide M-6-1
    New York State College of Agriculture
12. Forage Crops Contest Sheet - Insects Diseases (FFA Contest Forms)
    Vegetable Crops Contest Sheet Insects Diseases (FFA Contest Forms)
13. Cornell Misc. Bull -59 - Insects and Diseases in the home vegetable garden
14. A booklet - of 10 separate sheets - is available from University of Illinois - Agric. Co-op Ext. Service, Urbana, Illinois
    - Stored grain insects, household pests - corn insects -
    - small grain insects - legume insects, vegetable insects and fruit insects.

Visuals: Movies from Cornell University - Agriculture College Film Library
The Monarch Butterfly Story - 11 min color
Protecting Stored Grains from Destructive Pests 12 min. color
Spittlebug and Its Control - 16 min. Color
Battle of the Bugs - 11 min color
European Corn Borer - 10 min color
500,000 to 1 - 21 min color

Supply Source for entomology equipment

Ward's Natural Science Establishment
Incorporation
P.O. Box 1712
Rochester, New York 14603

Welch Scientific Co.
331 East 38th Street
New York 16, New York

MODULE OF INSTRUCTION

Title - **Farm Business Records** Code - 01.010401-01

DESCRIPTION:

Like all modern business enterprises, the farm enterprise must keep accurate records of all aspects of its business. Records should be kept on all labor needs, machinery used, cost per acre of each crop, inventory, and production. These are essential when analyzing the business, preparing income tax forms, asking for credit at a bank, or making future farm decisions. The students will be involved in farm business record activities in this module.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Needs and uses of records	1	0
2. Records that should be kept by each farm	1	0
3. Modern business forms used in the farm business	2	26
	4	26

Revised June, 1975

MODULE OF INSTRUCTION

Title - **Farm Business Records** Code - 01.010401-01

OBJECTIVES to be obtained:

The student will be able to:

1. List six (6) reasons for keeping records.
2. List five (5) types of necessary records that should be kept in order to successfully operate a modern farm business.
3. Calculate depreciation, correctly enter the data in a Farm Inventory Book and calculate the net worth, using class references and given inventory data.
4. Correctly place and summarize the data in a Farm Cash Account Booklet, given a cash account book and necessary record data on a modern farm.
5. Correctly set up Farm Machinery and Equipment Operating and Maintenance Records, given the necessary forms and record data.
6. Correctly enter and summarize the data in the Production Record Forms, given the necessary record forms and data.
7. Correctly record the data in a Crop Record Book, given the necessary forms and crop data.
8. Correctly record the data in a Labor Record Book, given labor data.

Code - 01.010401-01

Title - Farm Business Records

OBJECTIVES BY UNIT	CONTENT
Unit 1:	
The need and uses of farm records Objective 1 List six (6) reasons for keeping records.	A. Reasons for Keeping Records . Profit or loss . Business analysis and future decisions . Income tax . Maintain credit rating . Insurance claims (Fire and Theft) . Settling estates . Identifying lost animals and machinery . Personal satisfaction . Profit sharing . Proof of payment
Unit 2:	
Records that should be kept by each farm Objective 2 List five (5) types of necessary records that should be kept on a modern farm business.	A. Types of Records . Cash account . Inventory . Machinery operation and maintenance . Production . animal . crop . Labor
Unit 3:	
Modern business forms used in the farm businesses Objective 3 Calculate depreciation, correctly enter the data in a farm inventory book, and calculate the net worth, using class references and given inventory data.	A. Farm Inventory . Purposes of a farm inventory (using reference bulletin #5 and reference book #2 for the student) . list of what is owed and what is owned . includes all property and debts . shows net worth . How to make entries correctly . description . year bought . cost . years of life . depreciation . how to figure depreciation . straight line . sum of the digits . declining balance

EDUCATION

01.010401-01 - Code

Farm Business Records - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Resource people to class to speak on the importance of keeping records. Banker, Production Credit Manager, Extension Agent; Key Farmers, Insurance Company Representatives.	A. To recognize the need for keeping records . Discussion-ask questions of resource person . Stress overall value of records . Students set up individual and group work experience projects in crops & livestock enterprises. Keep Cost Account Records on all projects.	A. Oral or written test . List six (6) needs for records . Students may receive credit for completing records relating to objective 1
A. Discussion B. Actual record forms C. Use student committees to report on various types of records. D. Use student panel to compare types of records.	A. Look over the different record forms B. Award prizes for the best records kept by students at the annual Parent/Member Banquet or other similar activity conducted by the FFA or any Youth Leadership group in the school.	A. Oral or written test . List the five (5) types of records used to manage a farm.
A. Exercise: relating given data to inventory record book and/or B. Field trip (taking inventory of a small cooperating farm) and/or C. Independent study D. Let student use own data where possible.	A. Teacher prepare a list of information to be placed in the inventory booklet in the specified areas and/or B. Visit a cooperating farmer and have students obtain information about his business in their inventory books and finish calculation in the school laboratory. C. Use a home farm and complete the objectives at Unit 3.	A. Teacher evaluation: . Completion of the individualized instruction book on Farm Inventory published by Cornell University.

C de - 01.010401-01

itle - **Farm Business Records**

OBJECTIVES BY UNIT	CONTENT
	. Cattle . Other livestock . Food and supplies . how to compute grain and silage qualities . Farm real estate . Land and buildings . Other property . Long and short term liabilities . Other assets . Net worth

EDUCATION

01.010401-01 - Code

Farm Business Records - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES

Code - 01.010401-01

Title - Farm Business Records

OBJECTIVES BY UNIT	CONTENT
Unit 3 Objective 4: Correctly place and summarize the data in a Farm Cash Account Booklet, given a Cash Account Book and necessary record data on a modern farm.	A. Cash Account Book . Purposes . total receipts . total expenses . farm wages . principal payments . interest payments . new machines and equipment . real estate improvements . livestock bought . How to make entries correctly . date . size and quantity . description . cost . column . Special types of entries . receipt entries . summarization . increase and decrease in inventory . unpaid family labor . farm income
Unit 3 Objective 5: Correctly set up Farm Machinery and Equipment Operating and Maintenance records, given the necessary forms and record data.	A. Machinery Maintenance Records . Purpose . to schedule maintenance of machinery . record of repair and maintenance cost and cost of individual equipment.

EDUCATION

01.010401-01 - Code

Farm Business Records - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Demonstration and/or C. Field trip D. Let student use own data where possible E. Lab studies on cash account books. Students work informally in groups of 2-3.	A. Take given data and apply it to a Cash Account Book provided by the teacher. B. Visit a cooperating farmer to collect data for Cash Account Book and/or have the farmer come to class for the presentation C. Students keep cash account records on home farm.	A. Students make all entries in the cash account books under instructor's supervision. B. Special credit given for completing records on the home farm or cooperative farm.
A. Bring in resource personnel to discuss maintenance requirements and cost repairs. B. Class discussion on what things should be included in the check list.	A. Students take given data prepared in class and apply it to a Machinery Maintenance and Repair Form. B. Spend a day at a local or area farm machinery dealership to discuss the value of methods used to keep farm machinery and equipment records.	A. Students make entries on the Maintenance and Operating forms. B. Given adequate data students can make a decision on when to replace or trade equipment.

OBJECTIVES BY UNIT	CONTENT
	. What equipment should be included . What maintenance check should be included . Length of life . Condition when traded in . Time lost for repairs . Cost per hour . Determine when to replace machinery and equipment
Unit 3 Objective 6: Correctly enter and summarize the data in the Production Record Forms, given the necessary record forms and data.	A. Production Records . Used to determine: . total production per animal . total production per man . size of business . man equivalent . labor efficiency . basis for culling . selection of foundation animals . Basic types of entries . original cost . feed consumed . veterinary and medicine expenses . breeding fees . supplies . labor . other . number and size of offspring B. Dairy Records . Kinds . days milked . pounds of milk per day . total pounds of milk (how to figure) . test . pounds of butterfat (how to figure) . price . value of milk (how to figure) . pounds of roughage . pounds of grain . cost of feed . return above feed cost . other necessary data connected with the individual cow record . total herd production . pounds of milk sold per cow . pounds of milk sold per man . calculate the percent of feed cost to milk receipts per cow.

E D U C A T I O N

01.010401-01 - Code

Farm Business Records - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
C. Gather several maintenance records and cost repairs records from area farmer.		
A. Instructor illustrates how to place entries on Livestock Record and Dairy Record. Look over records provided by cooperating farmer. B. DHIA C. Owner sampler D. Let student use own data where possible.	A. Take given data from the instructor and/or from other records provided and apply it to a Livestock and Dairy Record Form provided by the instructor.	A. Students make all entries in the Livestock and Dairy Record Forms. B. Students identify the weak and strong points in a given farm's dairy and crop program. C. Oral and written test on Farm Business Analysis Factors.

OBJECTIVES BY UNIT	CONTENT
Unit 3 **Objective 7:** Correctly record the data in a Crop Record Book, given the necessary forms and crop data.	A. Field Crop Records . Purpose . field identification (number of acres and location) . planting data . fertilization data . harvest data . spray and dust data . other data . value of crops . summarization . income over expenses
Unit 3 Objective 8: Correctly record the data in a Labor Record Book, given labor data.	A. Purpose of labor records (using reference book #4 and reference bulletin #6, 7 and 8 for student) . Income tax . Social security . Labor efficiency . Man work units B. Employers responsibility . Insurance . Written agreement . Social security number . Record for income tax expenditure . Record for paying social security for the employer, employee and withholding taxes. . Part time . Piece work

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and demonstration B. Supervised study C. Independent study D. Look over Crop Record Sheets provided by cooperating farmer. E. Use a school crop demonstration project 1 to 5 acres of field corn for grain or silage. F. Use one or two demonstrations or individual projects on the home or cooperative farms.	A. Take given data from instructor and/or other forms, and apply it to Crop Record Forms provided by the instructor. B. Set up and carry out the entire crop demonstration planning, growing, harvesting and marketing the crop under the supervision of the teacher and resource people in the community.	A. Teacher evaluation of students' ability to make entries correctly on the Crop Record Form. B. Keep complete cost records on their crop demonstration projects.
A. Lecture B. Demonstration- Instructor illustrates how to place entries on labor forms. C. Supervised study D. Independent study E. Look over labor records provided by cooperating businesses. F. Invite a resource person from New York State Labor Department to speak to the class on Labor Laws and Required Records.	A. Take given data from instructor and apply it to a labor form. Figure employer and employees share of Social Securities. Compute withholding taxes and apply them to W2 Forms.	A. Teacher evaluation of students' ability to make entries in the Labor Forms and fill out a W2 Form.

Title - Farm Business Records Code - 01.010401-01

RESOURCE MATERIALS

Books: Teacher references

1. The Farm Management Handbook - Halland and Mortensin (Interstate)
2. Profitable Farm Management - Hamilton and Bryant (Prentice Hall)
3. Farm Management Guide - Doane's - St. Louis, Missouri 63141

Books: Student references

1. The Cornell Farm Account Book - Ext. W.P.-14M College of Agr. Economics, Cornell
2. Cornell Farm Inventory Book - Ext. W.P.-10M Dept. of Agr. Economics, Cornell
3. Field and Crop Record - Dept. of Agronomy Agr. Edu. Division, Cornell
4. Farm Business Record - Dept. of Ag. Economics, Cornell

Bulletins: Teacher references

1. Teaching Manual-Farm Income Tax Management Reporting-A.E.Ext. 521
2. Problems for Use in Teaching the Cornell Farm Account Book -
   Part I Simple entries
   Part II Suggested ways for making entries - A.E. Ext. 155
3. A Resource Unit for Teaching of Agr. on Using the Cornell Farm Account Book - Agr. Edu. Dept.
4. Farmers Tax Guide - District Office, Internal Revenue Service (teaching kit)
5. Field Crops - Cost and Returns - A.E. Res. 308
6. Livestock - Cost and Returns - A.E. Res. 310

Bulletins: Student references

1. Simple Entry Illustration in the Cornell Farm Account Book for use of farm families keeping records - E.E. Ext. 105
2. New York Farm Business Charts - A.E. Ext. 490
3. Itemized Record of a New York State Dairy Farm Business - A.E. Ext. 20
4. Taking the Farm Inventory - A program unit of instruction, College of Agr. CP - 5M
5. Itemized Record of a Farm Business - Ag. Econ. Ext. 95
6. Your Social Security Payments - OASI30
7. Farm People and Social Security - OAS 125F
8. Cornell Farm Employee Wages Record - College of Agr., Cornell Univ., 5M-W

MODULE OF INSTRUCTION

Title - USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION Code - 01.010402-01

DESCRIPTION:

The modern farmer, like other businessmen, needs accurate records in order to be competitive in his field.

The importance of recordkeeping will be stressed as it relates to livestock performance. Students will chart and compare growth, breeding, production, and health records needed to meet the selection of outstanding individual animals could be made.

Emphasis will be placed on keeping accurate records in such areas as milk production, breeding, egg production, litter size, and efficiency of converting feed into usable product.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. The importance of keeping livestock growth, production, breeding, and health records	3	0
2. Utilizing growth records on growing animals	3	2
3. Calculating lactation curves	2	0
4. Efficiency of feed conversion	3	0
5. Using parent-progeny information	4	0
6. Calculating Conception Rate	2	1
7. Uisng the herd health record	2	1
8. Analyzing Production Records	3	2
9. Importance of Accuracy in Keeping Records	1	1
	23	7

Revised June '74

MODULE OF INSTRUCTION

Title - USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION Code - 01.010402-01

OBJECTIVES to be obtained:

The student will be able to:

1. List 5 reasons each for keeping growth, breeding, production, mortality and health records.
2. Determine the weight of 10 growing animals of his choice, record weights, construct and analyze a bar graph of his findings.
3. Given a dairy record, the student will chart lactation curves on five animals.
4. Calculate and analyze the efficiency of feed conversion on 10 animals.
5. Using a comprehensive dairy beef or swine record the student will calculate and analyze parent-progeny differences on 5 pairs of animals.
6. Using a sample breeding record the student will calculate the conception rate of the dairy (or other) livestock to the nearest percent.
7. Use a herd health record to identify 5 animals who are conspicuous in their poor health. He will estimate dollar costs in veterinary fees and lost production on 5 unhealthy animals.
8. Use a comprehensive production record to select 5 dairy, beef, sheep, swine or poultry animals for culling, and 5 for selected foundation or breeding purposes.
9. List 2 reasons for keeping accurate records for each major record studied.

Code - 01.010402-01

Title - USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 1 - The importance of keeping livestock growth, production, breeding and health records Objective #1 List 5 reasons each for keeping growth, breeding, production, mortality, and health records.	A. For dairy production students will keep milk production records, breeding records, herd health records and feeding records on the home farm or cooperative farm for 12 months. . Students will use this information for culling and determining herd replacements for the farm B. For beef, hogs and sheep students will keep herd health records, feed conversion and breeding records. C. For poultry the students will keep records on mortality, feed conversion and egg production.
Unit 2 - Utilizing Growth Records on Growing Animals Objective #2 Determine the weight of 10 growing animals of his choice, record weights, construct and analyze a bar graph of his findings.	A. Students will tape or weigh the various classes of livestock that are being studied in class. B. The animals will be weighed at specific intervals that will be determined by the teacher, student and farmer. C. Students will record all data so that this information could be used to construct bar graphs during lab periods.

EDUCATION

01.010402-01 - Code

- Title

USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Classroom chalk and board B. Illustration of each record on overhead transparency. C. Examine various records from key adult farmers in the different enterprises. D. Field trips to farms at which time the importance of records will be discussed by the farmer and students. E. Visiting veterinarian invited to discuss the importance of records and how they relate to herd health problems. F. Feed company fieldmen invited to class to discuss the improtance of keeping livestock records.	A. Students will use these records for their work experience programs. B. Students could use data studied to exemplify leadership by implementing desirable changes in farm management on the home farm and on cooperative farms. C. Students could receive direct credit for complete records used in any enterprise for leadership training contest in livestock production and dairy production on the local, district, and state FFA levels.	A. Teacher will check on the records of each student and grade the records for marking purposes. B. Records will be checked for accuracy, neatness and validity. C. Students will list 3 of the 5 reasons for keeping records. D. Students will orally state the value of good records and how this information could be used in farm management. The reasons must be acceptable to the instructor.
A. Field trips to local farms to discuss the importance of weight gains and to demonstrate how to weigh or tape animals to determine weight gains. B. Overhead transparency to illustrate poor conversions and excellent feed conversion. C. Use posters to display work of students bar graphs in all classes of livestock. D. Use feed company personnel to discuss feed efficiency and how production rates are influenced by quality feeds.	A. Student committees will find the value of current feed materials forage of different quality and concentrates. B. Another student committee (smaller group) will find the current value of product. C. Students should individually calculate total cost of feed stuffs consumed (from a given record) and total value of product. D. Students should use a formula for efficiency of feed conversion (some variation of value of product divided by cost of feed) to calculate the efficiency of 10 animals E. The students will discuss the meaning of the feed efficiency information found	A. The teacher will listen to committee reports and comment on the reports. The teacher will determine accuracy of student calculations and assist students in the analysis of data. Determine student grades by input provided and accuracy of comments, oral grades. B. Given several sets of completed records students will calculate feed conversion efficiency and make comparisons regarding the various classes of livestock.

Code - 01.010402-01

Title - USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Calculating Lactation Curves Objective 3 Given a dairy record, the student will chart lactation curves on 5 animals.	A. Lactation Curve Construction B. Interpretation of Lactation Curves
Unit 4 - Efficiency of Feed Conversion Objective 4 Calculate and analyze the efficiency of feed conversion on 10 animals.	A. Determining feed costs B. Value of product C. Feed conversion formulas D. Need for accurate records

EDUCATION

01.010402-01 - Code

USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Teacher example or demonstration C. Invite AI personnel to discuss breeding programs that will improve desirable lactation curves.	A. Students could use corrective breeding to improve quality of livestock and persistency in milk production. B. The student should calculate parent-progeny difference on 5 sets of dairy (or beef, swine, sheep, poultry) animals The student should rank the animals from best to poorest increase in production. C. Students can use these records for future sales of their livestock.	A. The student should explain in paragraph form, the importance of records to progeny testing. B. The teacher should check calculations for accuracy. Teacher should check to see how students have used this knowledge on their farms. Direct application.
A. Discussion and visuals B. Make an analysis of DHIA records for income over feed costs. C. Use beef and hog feed conversion records to illustrate margins of income over feed cost using current feed prices.	A. Students should determine feed conversion and efficiency factors of the home farm livestock. B. Calculate feed conversion of students'animals units used in their supervised work experience programs.	A. The teacher will construct a written test on feed efficiency for the various classes of livestock. Students will study all data and determine the efficiency of the classes of livestock ranking the classes or groups excellent, good, fair, and poor. The instructor could develop an evaluation for Objective 4. B. Evaluate student supervised work experience records as they relate to efficiency factors.

OBJECTIVES BY UNIT	CONTENT
Unit 5 - Using Parent-Progeny Information Objective #5 Using a comprehensive dairy, beef, or swine record the student will calculate and analyze parent-progeny differences on 5 pair of animals.	A. Using progeny records for evaluation of desirable characteristics. B. List the weak and strong points of each pair of animals. C. The importance of selecting good breeding stock D. Progeny performance for culling E. The importance of accurate current records.
Unit 6 - Calculating Conception Rate Objective #6 Using a sample breeding record the student will calculate the conception rate of the dairy herd (or other) livestock to the nearest percent.	A. Calculating conception rates B. Factors affecting conception C. The importance of maintaining desirable calving, lambing and farrowing intervals. D. The economics of healthy breeding stock

01.010402-01 - Code

USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. DHIA supervisor used to discuss dairy records and production. B. Outstanding dairy or beef breeder used to describe his breeding programs and record system. C. Classroom discussion D. Field trip or lab session to observe a classifier work E. Invite a representative from pro-genetics, Ithaca, N.Y. to speak to the class on corrective breeding.	A. Students use information to select their own stock for projects. B. Students attend 4-H, FFA and Tri-Co. Holstein shows on cattle judging to learn more about selection and judging. C. Attend any livestock seminars conducted by the various breed associations beef, sheep, and hogs.	A. Given specific data on performance and progeny the student will evaluate records and data and select the superior animals. B. The student will list the reasons for his selections to the satisfaction of the instructor.
A. Chalk and board exercise in calculating conception rates B. Have students check on their home farm's or cooperative farms conception rates. Report this data to the class. C. Use a local veterinarian as a resource person to discuss conception problems with repeat breeders.	A. Students could check on their own farms and on cooperative farms regarding conception rates. B. Students could list the reasons for good and poor conception rates and make recommendations on how poor conception rates could be improved.	A. Given specific data on sample herds students will calculate the percent of conception rates at different farms. The teacher will evaluate the answers. B. Written test - essay question on factors that cause poor conception rates. Explain what farmers could do to correct problems of poor conception.

Code - 01.010402-01

Title - USING LIVESTOCK RECORDS TO IMPROVE PRODUCTION

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 7 - Using the herd health records Objective #7 Use a herd health record to identify 5 animals who are conspicuous in their poor health. He will estimate dollar costs in veterinary fees and lost production on 5 unhealthy animals.	A. Culling B. Selection of Sires C. Review programmed herd health D. Anticipating health problems E. Veterinarian and medicine costs F. Lost production due to poor health
Unit 8 - Analyzing Production Records Objective #8 Use a comprehensive production record to select 5 dairy beef, sheep, swine, or poultry animals for culling, and 5 for selected foundation or breeding purposes.	A. Conversion of actual records for comparison of individuals B. Selection of cull animals based on production or other herd health problems C. Using records to select foundation or breeding stock D. The need for accurate records
Unit 9 - Accuracy of Records Objective #9 List two reasons for keeping accurate records for each major record studied.	A. Review of need for accurate records (accuracy of records should be stressed throughout the module) B. Types of records . Milk production . Feed conversion . Health . Mortality . Breeding

EDUCATION

01.010402-01 - Code

Using Livestock Records to Improve Production - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class Discussion B. Slides showing healthy and unthrifty animals C. Guest resource person local veterinarian D. Problem solving - Identify cause factors for unthrifty animals. Discuss preventative controls.	A. The student should enter in his notes the usefulness of herd health records in culling, selection of sires, and anticipating health problems. The students should prepare questions in advance regarding programmed herd health, records, and health problems. B. The student should select 5 animals with a serious health problem from a comprehensive health record. C. The student should estimate dollar costs in veterinarian fees and lost production on the 5 animals.	A. The teacher should give a written quiz involving the use of health records for culling, etc. The student will be given a performance exam on selecting animals that have poor health. B. The student will identify the causes of poor herd health to the satisfaction of the teacher.
A. Teacher should do sample problems-student practice Teacher should show students how to evaluate records and make decisions when culling and selecting foundation breeding stock.	A. The student should become familiar, through practice, with the calculations involved in converting production records for maturity and length of lactation and times milked (for dairy only). B. The student should select 5 animals for culling based on production and 5 for use as foundation stock.	A. After practice give a selection of 3 to 5 records for conversion grade on accuracy. B. Allow students to orally give reasons for culling animals. Accuracy on calculations, teacher judgment on choices.
A. Class discussion-teacher summary. B. Use sample records for illustrations.	A. The student should list two reasons for keeping accurate records for each record studied in his notebook. B. Use records for individual enterprise related to supervised work experience programs.	A. Oral examination on reasons for keeping records. B. Written examination on importance of records.

MODULE OF INSTRUCTION

Title - Using Livestock Records to Improve Production   Code - 01.010402-01

Evaluation:

Table I - Supplementary information

Suggested items of concern when comparing production standards for beef, sheep, swine, dairy cattle, broilers, and laying hens.

a. pounds of gain per day (beef, lambs, swine)

b. weight of pigs (or litters) at 35 days

c. Thickness of back fat (market swine)

d. size of loin eye (beef)

e. number of lambs per ewe

f. pounds of milk per year (dairy)

g. pounds of meat per pound of feed (broilers)

h. number of eggs per year (laying hens) - **Feed per dozen eggs**

MODULE OF INSTRUCTION

Title - Using Livestock Records to Improve Production

Code - 01.010402-01

RESOURCE MATERIALS

Books

Diggins & Bundy, Dairy Production, Prentice Hall, Inc., 341 pages. $6.48

Fuergensen & Mortenson, Approved Practices in Dairying. Interstate, Danville, Ill.

Bulletins & Leaflets

New York State College of Agriculture, Cornell University, Ithaca, N.Y.

Feeder Pig Production & Marketing in N.Y.S.	Ext.Bull.#1210
Raising Beef Cattle in N.Y.S.	Ext.Bull.#1011
Laying Flock Management	Ext.Bull.#1061
Breeding Cows for Longer Herd Life	Ext.Bull.#1199
Estimating the Transmitting Ability of Cows	Ext.Bull.#1196
Herdmate Comparisons and their use in evaluating Dairy Cows	Ext.Bull.#1115
Feeding the Dairy Cow for Maximum Returns	Ext.Bull.#1156

Eastern Artificial Insemination Cooperative
Maintaining High Breeding Efficiency in the Dairy Herd

Dept. of Animal Science, Morrison Hall, Cornell University
Putting Your Dairy Records to Work, Series 11

Audio Visuals

American Angus Association
Production Records-Your Biggest Advantage
movie, 1969, color, 30 minutes (not previewed by author)

Eastern Artificial Cooperative
Maintaining High Breeding Efficiency in the Dairy Herd
(overhead masters with bulletin)

Other Useful Materials

Breed Associations & Coops
Breeding Record Forms & Breeding Information

Dairy Herd Improvement Cooperative, Morrison Hall, Cornell University
John Doe Record Set (set of sample computerized dairy records)

MODULE OF INSTRUCTION

Title - **FARM BUSINESS ANALYSIS** Code - 01.010403-01

DESCRIPTION:

The modern farm operator must constantly evaluate all aspects of his operation and make plans to reorganize those areas that need improvement. He must keep accurate records of production and labor, and an inventory of current supplies. He must use modern business techneques if he is to compete in this industrialized farming era. This module will give the student an opportunity to learn how to analyze factors of rates of production, labor efficiency, and costs to improve his farm operation.

MAJOR DIVISIONS OR UNITS OF CONTENT:	Time Allocations Class	Time Allocations Other
1. Importance of Farm Business Analysis	2	3
2. Calculating Farm Business Measures	10	5
3. Analyzing Farm Businesses	5	5
	17	13

Revised 4/75

MODULE OF INSTRUCTION

Title - Farm Business Analysis Code - 01.010403-01

OBJECTIVES to be obtained:

Students will be able to:

1. Correctly list three purposes for performing a farm business analysis.
2. Differentiate, to the instructor's satisfaction, between a farm business summary and a farm business analysis.
3. Correctly list a minimum of six measurable factors affecting returns to a farm business.
4. Given the necessary records, correctly calculate amounts for at least ten of the factors affecting returns to the farm business, for which you have records.
5. Correctly calculate at least ten selected farm business measures used in financial statement analysis, for the farm from which you have records.
6. List the four basic resources a farmer has to work with to produce goods and analyze, to the instructor's satisfaction, each for a selected farm.
7. Analyze records and physical characteristics of a selected farm business in terms of factors from objectives 4,5 and 6, then recommend to the instructor's satisfaction changes based on your analysis.

Code - 01.010403-01

AGRICULTURAL

Title - Farm Business Analysis

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Importance of Farm Business Analysis Objective 1 Correctly list three purposes for performing a farm business analysis.	A. Purposes of Farm Business Analysis . To determine how the business is doing at a given time. . To determine why the business is as it is. . To compare the farm with others or groups of similar farms. . To evaluate each part of the business as well as the whole. . To provide budgeting changes in the farm business.
Objective 2 Differentiate, to the instructor's satisfaction, between a farm business summary and a farm business analysis.	A. Farm Business Summary - Record forms allowing you to see how the farm as a whole has profited. . Operating statement . Financial statements B. Farm Business Analysis - calculations taking an in depth look at all enterprises on the farm and their individual profitability . Measures depend upon type of enterprise-examples . Some enterprises affect others - examples C. Samples of summaries and analysis for individual farms and groups of farms, . Individual records . Group summary

01.010403-01 - Code

Farm Business Analysis - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A.Lecture-discussion to present new information. B.Demonstrate sample records and group farm business summaries to show how analysis may help the farm business. C.Guest speaker such as county agent involved in farm analysis. D.Guest speaker from a local Bank-Farm Representative.	A.Take notes on information presented. B.Student discussion of need for farm business analysis-may ask questions of guest speakers.	. Written test.
A.Lecture-discussion to present information. B.Demonstration of farm business summaries and analysis.	A.Students take notes on information presented. B.Students may make some calculations from a summary which would be used in an analysis. C.Students may complete a farm business summary or a farm business analysis on their home farm or cooperative farm.	A. Written test. B.Oral Reports on farm business analysis-students identify week and strong parts of a farm business.

Co - 01.010403-01

Title - Farm Business Analysis

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Calculating Farm Business Measures Objective 3 Correctly list a minimum of six measurable factors affecting returns to a farm business.	A. Factors affecting returns to a farm business. Factors — Example measures . Size - acres, no. of animals, gross sales, man work units . Rates of Production - tons per acre, units per animal, units per man . Labor efficiency - animals per man, acres per man, $ sales per man . Capital efficiency - Labor income, returns to capital, $ per production unit . Cost control - feed per animal, cost per unit sold . Economic climate - supply and demand, parity ratio, inflation rate . Market price - prices the farm receives . Farm losses - spoilage, death, spillage, non payment. B. Measuring factors affecting returns to a business-examples given above. C. Relative importance of various factors to different farm enterprises.
Objective 4 Given the necessary records, correctly calculate amounts for at least ten of the factors affecting returns to the farm business for which you have records.	. Calculations for measures of factors affecting returns to a farm business. (Teacher should select factors based on local situation.)

EDUCATION

01.010403-01 - Code

Farm Business Analysis - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A Lecture-discussion to present information. B Field trip to a cooperating farms, students should list factors affecting returns to the farm and their relative importance. C Group discussion of information obtained on field trip. D Chalk and board teacher work out Example problems.	A. Take notes on information. B. During field trip attempt to determine factors affecting returns to the business and how they might be measured, this should be recorded for reference. C. Participate in group discussion. D. Students keep a record of definitions used in calculating Farms Business Measures.	A .Evaluate students notes taken during field trips. B .Written test on Farm Business Measures.
A. Group concensus to determine calculations to be used (each student should be familiar with at least 15 calculations) B. Demonstrations of methods to preform calculations. C. Student practice. D. Field trip-if time permits obtain information from a farm for students to calculate.	A. Participate in group discussion to determine calculations to use. B. Take notes during demonstration. C. Practice making calculations assigned in class. D. Students complete calculations on the home farm or cooperative farm.	A .Evaluate student participation. B .Written test on selected measures and completing calculations.

Code - 01.010403-01

Title - Farm Business Anlaysis

OBJECTIVES BY UNIT	CONTENT
Objective 5 Correctly calculate at least ten selected farm business measures used in financial statement analysis for the farm which you have records for.	A. Farm business measures taken from financial statements . Cash flow . Debt repayment capacity . % equity . Debt per productive unit . % total debt in long term loans . % farm business assets are of total assets . % of assets readily convertible to cash . % return to owned capital . % return to all capital . % return to various enterprises . Capital turnover . Growth of assets . Fixed expenses - variable expenses . Other B. Calculations for selected business measures. (see references) C.. Relative importance of measures to individual enterprises . Major enterprises vs. minor enterprises . Year around enterprises vs. short term enterprises. . Direct income enterprises vs. supporting enterprises.
Unit 3 - Analyzing Farm Businesses Objective 6 List the four basic resources a farmer has to work with to produce goods and analyze to the instructor's satisfaction, each for a selected farm.	A. Basic farm production resources . Land . Capital . Labor . Management B. Relative importance of each to farm production . Crop production . Animal production C. Methods of analyzing production resources . Physical discription . Use of records . Problem solving method to test alternatives

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to present information. Teacher work out examples on board. B. Field trip(s) to determine measures used by farmers. C. Student practice in calculating measures.	A. Take notes during presentation and field trip(s) B. Practice calculations	.Written test on any 10 selected calculations out of 14.
A.Lecture discussion to present information. B.Group concensus to determine relative importance of resources. C.Resource person such as county agent to discuss methods of analyzing production resources. D.Student practice for a given farm the students have visited.	A.Take notes on information. B.Participate in group discussion. C.Question resource person. D.Practice analyzing production resources for a given farm. E.Students should select the enterprizes that should be succesful in the local areas and list the reasons for their selections.	A.Students will list the four basic resources that a farmer must work with to produce products. B.Students will give oral reasons for enterprise selections for a given farm.

Code - 01.010403-01

Title - Farm Business Analysis

OBJECTIVES BY UNIT	CONTENT
Objective 7 Analyze records and physical characteristics of a selected farm business in terms of factors from objectives 4, 5 and 6, then recommend to the instructor's satisfaction changes based on your analysis.	A. Farm records to include, . Balance sheet (financial statement) . Operating statement . Information adequate to fill in a farm business chart. . Net worth statement. B. **Factors** to consider in evaluating records for a **business** change. . Time period the records cover . Are the records characteristic of past years? . Affect of one change on entire business Are records accurate in terms of what is being done in the business? . Expected future changes affecting the business, based on current knowledge . Others

EDUCATION

01.010403-01 - Code

Farm Business Analysis- Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to show students what is contained in the records and to clarify the assignment. B. Field trip to allow students opportunity to evaluate selected farm. C. Student supervised study to meet objective 7. D. Group discussion after all have completed the assignment. Student Reports. E. Lab excercises on Objective 7	A. Take notes on information gain understanding of records and how they are used. B. Perform assigned calculations, analyze records, and recommend changes. C. Take part in group discussion after assignment is completed. D. Students could calculate their own net worth statements on their accumulated folders that are required for each student studying vocational agriculture.	A. Evaluate completed assignment. B. Evaluate students notebook for the module. C. Grade students accumulative folder work.

MODULE OF INSTRUCTION

Title - Farm Business Analysis Code - 01.010403-01

RESOURCE MATERIALS

Books:
1. Farm Management Handbook-1972, Cornell University, Economics Department
2. Profitable Farm Management-Hamilton and Bryant - Prentice Hall
3. Managing the Farm Business - Beneke, J. Wiley & Sons, N. Y. , N. Y.

Bulletins:
1. Dairy Farm Management Business Summary -current year from Cornell Agriculture Economic Department
2. New York Economic Handbook - latest edition - Cornell Agriculture Economic Department

Periodicals:

Successful Farming

Farm Journal

Audivisuals:
1. Records of individual farm businesses available from Agriculture Economics Department, Cornell University
2. Sample ELFAC records
3. Farm business charts
4. Cornell farm inventory books and other types
5. Cornell cash account books and other types such as New Hollands
6. A.E. records available from ATANY

MODULE OF INSTRUCTION

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

Code - 01.010403-02

DESCRIPTION:

The student will study the Farm Power, Machinery, and Equipment Needs of a farm business. The size and type of farm, soils and topography, capital and labor resources will be studied.

This module will include the criteria used in purchasing machinery and equipment, selecting the dealer, whether to purchase new or used equipment, and scheduling equipment purchases.

Students will take field trips to farm machinery dealerships and farms to better understand the problems involved in meeting the farmers' power, machinery and equipment requirements.

The economics of owning, renting, leasing, cooperative ownership and custom hire of machinery for a particular farm business will be discussed.

The fixed and operational cost of owning and operating machinery will be studied.

Students will learn how to keep and use farm power and machinery records and to compare the records of costs with farms throughout the State to determine the investments and efficiency of a particular farm business. The total investment in machinery and its relationship to labor income will be studied.

DIVISIONS OR UNITS OF CONTENT		Time Allocation	
		Class	Other
I.	Determining Needs	3	6
II.	Alternatives Available	3	6
III.	Purchasing	3	3
IV.	Records	3	3
		13	18

Revised 4/75

MODULE OF INSTRUCTION

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS   Code - 01.010403-02

OBJECTIVES to be obtained:

The student will:

1. List six factors that are used to determine the farm power, machinery and equipment needs of a farm business.
2. Determine the needs for power units, machinery and equipment in terms of number and/or size of units.
3. Inventory farm power, machinery and equipment to determine present and future needs.
4. Determine the alternatives available to a farmer for a given enterprise for power units, machinery and equipment.
5. Demonstrate the ability to select from the alternatives the alternative that will best satisfy a given situation.
6. Write a set of general specifications for a piece of machinery or power unit based on a farm situation and on this basis select the unit best suited for the situation.
7. Select the dealer from whom a power unit or machine will be purchased.
8. Develop and maintain permanent and temporary records for power units, machinery and equipment.

Code - 01.010403-02

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

OBJECTIVES BY UNIT	CONTENT

Unit I - Objective #1.
List six factors that are used to determine the farm power, machinery and equipment needs of a farm business.
	Selection factors based on:
	. Size and type of farm
	. Soil types
	. Topography
	. Field shape, size and location
	. Labor force
	. Skill of operator
	. Capital availability
	. Dealer service
	. Equipment required for -
	  . efficiency
	  . mechanization
	  . automation
	Relationship of equipment to income
	. Size of business
	. Date of production
	. Labor efficiency
	. Combination of enterprise

01.010403-02 - Code

EDUCATION PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
List the agricultural enterprises in the community. Study machinery requirements using farm power machinery data from Department of Agricultural Economics Publications Cornell and Farm Business Analysis Studies. Take field trips to dairy, fruit, poultry, vegetable farms in the area. Have students list the types of machinery and equipment found on these farms. Talk to the operators regarding their equipment needs, the equipment that they lack, and how they determine their needs. Students divide into small groups and make lists of equipment requirements for the various enterprises. Students should write the reasons for their selections and report to the class explaining their reasons. Explore the relationship of equipment use to income, through use of farm business studies - of county and/or state. Comparison of man work units of 10 years ago with present for various enterprises.	A. List the factors that are used to determine the power, machinery and equipment needs of a particular farm business. B. Recognize the correlation of mechanization - labor efficiency and labor income.	Students will list six factors that are used to determine the needs for power, machinery and equipment.

Code - 01.010403-02

AGRICULTURAL

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

OBJECTIVES BY UNIT	CONTENT
Unit I - Objective 2. Determine the needs for power units, machinery and equipment in terms of number and/or size of units.	A. Factors to include: . Size of enterprise . Field conditions (size-shape-topography - drainage, etc.) . Labor force . Weather conditions . Present equipment B. Field capacity or efficiency . Factor influences • machine width • speed of travel • down time • draft requirements

E D U C A T I O N 01.010403-02 - Code

PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture-Discussion of comparison of different size of machines and the work that can be done in a given time element. Listing of factors that would be considered in size of machine selected, in terms of enterprise and/or field capacity. Field trip or work experience on school demonstration plot comparison of tractor work as plowing - 2 plow vs. 3 plow - single row vs. two row chopper. Comparison of need for power units for operation of various size equipment Compaction comparison of different weight machines of tractors on fitted land. Supervised study using references Problem solving of machine field capacity.	Problem solving of selected problems to determine efficiency of various machines under typical situations. Observations of field work measurements, timing.	Students will make selection of size of equipment and number of units necessary for operation at an efficient level for a single crop enterprise.

Code - 01.C10403-02

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

OBJECTIVES BY UNIT	CONTENT
Unit # I - Objective 3. Take an inventory of farm power machinery and equipment to determine present and future needs	Inventory of present farm equipment . Number of units . Size of units . Data of manufacture or model . Condition of units . Degree of obsolescence
Unit II - Alternative Available Objective # 4. Determine the alternatives available to a farmer for a given enterprise for power units machinery and equipment.	A. Alternatives . Do without replacement . Replacement use inefficiently . Replacement doing customs work . Cooperative ownership . Hire the work done . Rent equipment . Lease equipment . Replace with second hand equipment

EDUCATION

01.010403-01 - Code

- Title

PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Field trip to farm for purpose of taking an inventory of power units, machinery and equipment.	Take a farm equipment inventory, and determine the condition of the machinery, good - fair-poor. Determine which machines and power units need replacement with justification as to reason based on objective #2.	Students will make an inventory of equipment, power units and machinery on a farm to instructor's satisfaction.
Brief discussion of the alternatives that are available for a farm to use for the various enterprises in a given situation.	Students list the various alternatives available for enterprises in given situations.	Students list possible alternatives available for a given situation.

Code - 01.010403-02

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

OBJECTIVES BY UNIT	CONTENT
Unit II - Objective #5 Demonstrate the ability to select from the alternatives the alternatives that will best satisfy a given situation.	A. Alternatives . Owning . cost . convenience . Leasing . availability . cost . seasonality . Custom hire . cost . labor . timing . Group ownership . cost . repairs . use schedule . group responsibilities . Liability . custom hire . leasing . group ownership

EDUCATION

01.010403-02 - Code

FARM

PLANNING POWER, MACHINERY AND EQUIPMENT NEEDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Unit II - Invite owners or dealerships to discuss owning and leasing equipment with class members. Invite custom operators to speak to the students or use the tape interview dealing with prices, equipment involved, timing problems and work schedule . Use Extension Service Charts and Commercial Charts on rates for custom work. Cost account enterprise evaluation analysis for field crops. Invite dealerships to the lab and discuss leasing equipment and current rates, responsibilities of all parties, breakage and damage problems, liability. Have farmers that own machinery jointly present their agreements. Discuss the problems of their agreements. Discuss the problems of group ownership. This can best be done by interview using a tape recorder. Divide the class into four groups, role play, owning - leasing - ' custom hire and group ownership of machinery and equipment. Have students define the advantages and disadvantages of each. Problem solving using given situation for group discussion.	Role playing as outlined under method. Become familiar with custom machinery rates by preparing list of jobs and rates applied. For a given situation compare the costs of ownership to the other major alternatives.	Student evaluation as to the better alternatives to situation to instructor's satisfaction.

OBJECTIVES BY UNIT	CONTENT
Unit II - Objective #5 (continued) Demonstrate the ability to select from the alternatives the alternative that will best satisfy a given situation.	B. Cost involved in owning and operating machinery and equipment. . Fixed costs . depreciation . taxes . insurance . interest on investment . storage . Operating costs . maintenance . gas and oil . lubrication . repair bills

01.010403-02 - Code

PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Analysis of cost account. Records - Compare local farms with state studies for the enterprises in the local area.	Determine the total cost of operation of a piece of farm machinery or power unit and compare the costs to rental, lease custom and group ownership for a single crop.	Student evaluation as to the better alternatives to situation to instructor's satisfaction.
Evaluate cost data available from commercial companies.		
Have students keep records on fixed and operating cost of machinery on their farms.		
Supervised study or discussion based on Chapter 3. pgs. 10-13 Farm Power and Machinery Management, or Chapt. 35 - Tractor and Machinery Management pgs. 533-548, Machines for Power Farming.	Compare total machine and labor cost of home situation to that of other farms of relative size for state or county.	
Comparison of varying ways to determine depreciation in terms of dollar values.		
Students should make a list of all fixed and operating costs of owning and operating equipment. Compare these costs with leasing and custom rates. Compare the home farm with state wide data for a given situation.		
Make an analysis of the machinery and equipment records. Compare the costs of the home farm with others of the same size. Determine the weak and strong points-make adjustments.		

Code - 01.010403-02

AGRICULTURAL

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

OBJECTIVES BY UNIT	CONTENT
Unit III - Purchasing Objective #6. Students will write a set of general specifications for a piece of machinery or power unit based on a farm situation and on this basis select the unit best suited for the situation.	A. Determine the situation B. Based on situation determine size and basic needs C. Examine the market availability for the machine D. Comparison of machines . Size . Capacity . Safety . Price . Service and repair problems . Other features E. Write set of general specifications based on the situation.
Unit III - Objective #7. Select the dealer from whom a power unit or machine will be purchased	Sales organization to consider. A. Dealer . Reliability . Reputation for: . honesty . service . Parts inventory . stock on hand . maintenance of inventory . Repair facilities . mechanic ability . shop facilities . costs B. Completion of sale . Time to make purchase . Price . trade in allowance . Terms for credit . sources of credit . Sales purchases forms

E D U C A T I O N

01.010403-02 - Code

PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Develop with the class a problem situation based on a farm that has been visited earlier on the school facility and determine the size and needs of the machine or power unit. Field trip to several dealers to look at machine(s) and talk with dealer about features of this product. Examine sales literature and other dealer information relative to the product under consideration. Class discussion of features found on machines as listed in the content. Consider reaction of farmers in the neighborhood who already are using these machines and have experiences. Look for strong and weak points. Individual instruction which students write their specifications. Oral reports on machine or power unit selected.	Development of the situation. Talk with dealers about features that are on the machine. Collect sales literature dealing with the machine or power unit and evaluate strong and weak points of each product. Prepare a set of general specification for the machine or power unit. On the basis of the specifications select the machine or power unit that would be purchased giving valid reasons. Present as an oral report.	Student development of the situation in participation. Written specifications for the machine or power unit to instructor's satisfaction. Oral report on the machine selected with valid reasons to instructor's satisfaction.
Lecture-discussion of the importance of selection of dealer and the service provided. Field trip to dealership to observe the parts inventory and how stock is maintained. Discuss with dealer the sales aspect in terms of: (a) price (b) trade (c) finance (d) record keeping and legal papers (e) new vs. used equipment. Have students prepare samples of sales and credit forms as well as figure the final price for the machine as discount, trade vs. the list price (Emphasis should not be placed on how credit is arranged as students will have had this material in the module on farm credit).	Group evaluation of dealership in terms of strong and weak points based on the content materials of: Reliability Reputation Parts inventory Repair facilities Preparation of sales records and forms. Determine the sales price of an item figuring best price with and without trade. Determine sales price in terms of total price paid after credit cost is applied.	Students select a dealer whom they feel they could do business with. Written test determine best price for a machine using several methods of sale and credit arrangements.

Code - 01.010403-02

Title - PLANNING FARM POWER,MACHINERY AND EQUIPMENT NEEDS

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit IV. - Records Objective #8. Develop and maintain permanent and temporary records for power units, machinery and equipment.	A.Records needed for Machinery Records - . Inventory . number of units . size of units . date of purchase . price . condition . Depreciation schedule . tax purposes . straight line . sum of digits . declining balance . salvage value . practical purposes . annual use . obsolescence . costs of repair . Fixed costs . depreciation . taxes . insurance . interest on investment . storage . Operational cost (variable costs) . maintenance . fuel . lubrication . repair . Temporary and Permanent records

EDUCATION 01.010403-02 - Code

PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion in review of the inventory importance from objective #3.	Problem solving of various methods of determination of depreciation.	Develop and maintain permanent and temporary records for power units, machinery and equipment.
B. Lecture method of the tax depreciation basis as compared to the practical purposes.	Problem solving of various methods of determining fixed and operational costs.	
C. Have students work several problems using various methods of determining depreciation rates.	Develop set of permanent and temporary records for power units, machines and equipment showing - . Inventory . Depreciation . Cost of operation.	
D. Discuss the comparison of fixed vs. operational costs of a machine or power units.		
E. Have students determine various total costs for a machine or power unit.		
F. Study existing record forms available for machinery, equipment and power units as cash account records, farm inventory and operational records.		
G. Students develop set of power unit, machinery and equipment records necessary for a farm business. a. inventory b. fixed costs c. operational costs		

MODULE OF INSTRUCTION

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

Code - 01.010403-02

RESOURCE MATERIALS

A. Books - Doane's Farm Management Guide.
Profitable Farm Management. Hamilton & Bryant.
Farm Machinery Service Manuals.
Machines for Power Farming - Stone & Gulvin, 2nd ed. Wiley
Farm Power and Machinery Management - Hunt - Iowa State Univ. Press - Ames Iowa
Farm Management Handbook - Department of Agricultural Economics IMS.

B. Bulletins -

Farm Inventory Book. Cornell University
Handling Hay Crops - 365. Cornell University.
Tillage and Soil Manipulation - 353. Cornell University.
Auger Conveyors - 325. Cornell University
Mechanical Equipment for Handling and Feeding Forage - 348. Cornell Univ.
Hay Conditioners - 339. Cornell University
Preparing Farm Income Tax - I.R.S. - U.S. Government Printing Office
Agricultural Engineering Extension Bulletin No. 363-364-365, Department of Agricultural Engineering - College of Agriculture - I.M.S.

C. Periodicals -
Farm Technology.
Successful Farming. Machinery Management Issue, February issues.
Selected Principles Based on the Relationship of Certain Economic Factors to Labor Income. Cornell University.
Farm Management Handbook. Cornell University, current year.
Summaries of N.Y.S. dairy farm business, current year.
Farm Business Chart. Agricultural Economics, Cornell University.
Hoards Dairyman - Fort Atkinson, Wisconsin

D. Audiovisuals -
Farm Machinery & Equipment Companies
International Harvestor
Case - Ford
John Deere
New Idea

MODULE OF INSTRUCTION

Title - FARM LABOR MANAGEMENT Code - 01.010404-01

DESCRIPTION:

Management of farm labor has become an integral part of the farm business. Hiring and keeping interested and dedicated individuals is essential to everyone involved in the agricultural industry.

Students involved in this module will be primarily involved with determining labor needs, methods of advertising, evaluating prospective employees, incentive plans, state and federal requirements, required records, and employer-employee relationships. Emphasis will be placed on agricultural conditions in the local and statewide areas.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Determining Labor Needs in the Farm Business	1	4
2. Techniques of Securing Farm Labor	2	7
3. State and Federal Regulations	1	2
4. Labor Records	4	2
5. Employer-Employee Relations	2	5
	10	20

Revised June 1974

MODULE OF INSTRUCTION

Title - FARM LABOR MANAGEMENT Code - 01.010404-01

Objectives to be obtained:

The student will be able to:

1. Identify the major source of existing farm labor in his surrounding area.
2. Determine the labor efficiency of a farm.
3. Complete a farm business chart for a given operation for man work units and man equivalent.
4. Identify the labor needs in a given situation using information on a farm business chart for making an analysis of the labor requirements.
5. Write a job description for three types of farming jobs.
6. List four methods of securing farm labor, use one method (other than the newspaper) to illustrate how effective it is in securing farm labor.
7. Write a newspaper ad for farm labor.
8. Describe four qualities to seek in an employee.
9. Evaluate to the instructors satisfaction job applications through the study of resumes, interviews and references.
10. List ten state and federal regulations which presently apply to farm labor.
11. List seven items that are included in farm labor records.
12. Demonstrate to the instructors satisfaction your ability to complete farm labor records to comply with state and federal regulations.
13. List ten ways that a farmer can stimulate his labor force so that the force can be efficient, productive and loyal.
14. Make an incentive proposal for farm labor.

de - 01.010404-01

tle - FARM LABOR MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Determining Labor Needs in the Farm Business. Objective 1 Identify the major source of existing farm labor in his surrounding area.	A. Types of farms in area . Dairy . Beef . Poultry . Truck . Grain B. Examples of levels of employment sought . Management . Recordkeeper . Mechanic . Herdsman . General laborer C. Amount of family labor available D. Adult labor available E. Current graduates from high school and post high schools F. Migrant labor
Objective 2 Determine the labor efficiency of a farm.	A. Farm acreage (total) B. Crop acres C. Number of livestock D. Amount of machinery E. Crop production F. Product production G. Automation H. Comparison of all of these above with a cross section of state farmers.
Objective 3 Complete a farm business chart for a given operation on man work units and man equivalent.	A. Man work units B. Man equivalent

EDUCATION

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FARM LABOR MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trip to survey area operations. B. Guest speaker . County farm labor coordinator. Topic: Types of labor existing in the area. . Owner or manager of a farm employing two or more hired personnel year round. Topic: Types of labor used on his farm. C. Make a school district labor survey.	A. Discussion of types of operations discovered (develop a list of types in the area for notebook). B. Discussion of problems and questions with each speaker. Write one question to ask each speaker. C. Students could keep a farm labor employment list for the school district.	A. List 4 sources of farm labor. B. Students make a farm labor survey for the school district.
A. Lecture and class notes. B. Class - review records. C. Expose students to farm business chart. D. Comparative analysis of local farms with state farms.	A. Make a labor efficiency analysis of your home farm or cooperative farm.	A. Teacher evaluation of a sample farm that students will use for labor efficiency analysis.
A. Review Farm Business Chart. B. Use examples of farms for practical experience. C. Use Cornell Farm Business Charts - current charts.	A. Discussion of chart. B. Plot ranges of example farms on the charts - compare these with other farms listed. C. Student home farm comparisons.	A. Written test on farm business analysis, total man work units and man equivalent.

Code - 01.010404-01

Title - FARM LABOR MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Objective 4 Identify the labor needs in a given situation using information on a farm business chart for making an analysis of the labor requirements.	A. Analysis of the following . Size of business . Acres of crops . Number of livestock . Labor available
Unit 2 - Techniques of Securing Farm Labor. Objective 5 Write a job description for three types of farming jobs.	A. Farm manager B. Herdsman C. Farm hand or laborer D. Farm mechanics E. Part time help
Objective 6 List four methods of securing farm labor. Use one method (other than the newspaper) to illustrate how effective it is in securing farm labor.	A. Role of state and area employment agencies. B. Notices posted in farm machinery dealerships and food stores. C. Field men in agri-business. D. Other farmer word of mouth. E. Two and four year colleges. F. Extension service.

EDUCATION

01.010404-01 - Code

FARM LABOR MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use example of a farm business for class discussion. B. Review some adult farmer records in the school district.	A. Using the home farm or cooperative farm, make a labor analysis of labor needs on the farm.	A. Given a sample farm business record students will make an analysis of the labor needs of the farm and list their recommendations.
A. Lecture and class notes. B. Supervised study. C. Discussion of job descriptions. Teacher will illustrate how to make a job description using the following: . Duties . Responsibilities . Hours . Working conditions . Wages	A. Students will be assigned various types of farm jobs. They will research the job for a youth power project "careers in agriculture." Students will exchange data.	A. Teacher evaluation of careers in agriculture youth power project. Written and/or oral reports.
A. Class discussion. B. Assign students to interview farmers. C. Visit employment agency.	A. Discussion in class. Question farmers about their methods of seeking employment. B. Compile a list of those discussed in class. C. Set up class employment agency for the school district.	A. Teacher evaluation of students. Reports regarding farmer interviews.

OBJECTIVES BY UNIT	CONTENT
Objective 7 Write a newspaper ad for farm labor.	A. Job description B. Place of employment C. Who to contact D. Arranging for interview
Objective 8 Describe four qualities to seek in an employee.	A. Desirable qualities . Enthusiasm . Honesty . Punctuality . Interest and attitude . Ability . Performance
Objective 9 Evaluate to the instructor's satisfaction, job applications through the study of resumes, interviews, and references.	A. Resume B. References C. Interview

EDUCATION

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FARM LABOR MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture using newspaper articles as examples. B. Supervised activity. C. Hoards Dairy Classified ads.	A. Note taking B. Creation of article to be scrutinized by instructor and peers during discussion.	A. Teacher evaluation of article.
A. Teacher can cite good farm workers in the area and identify their desirable traits. B. Identify undesirable characteristics that cause employee problems.	A. Note taking - prepare self-analysis regarding students . Honesty . Punctuality . Interests and attitudes . Ability . Enthusiasm . Performance	A. Students will list five desirable qualities of an employee. List five undesirable qualities of an employee.
A. Lecture and class notes. B. Discussion of forms as to content (attached). C. Role Playing D. Discuss limitations of evaluation criteria.	A. Fill out forms (applications) B. Conduct interview as employer and applicant as role playing. Use individuals. C. Evaluate each applicant.	A. Teacher evaluation based on job applications made by students. B. Students will write resumes of their qualifications.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - State and Federal Regulations. Objective 10 List 10 state and federal regulations which presently apply to farm labor.	A. Required state and federal regulations . Wages . Social Security . Workman's compensation . Minimum wages . Migratory labor . Occupational health and safety act . Child labor laws . Occupational Safety Health Act (OSHA) B. Optional . Federal and state withholding for taxes . State unemployment insurance C. Federal forms . Social Security . Income tax . Other D. State Forms . Income tax . Workman's compensation . Time card . Statement of earnings . Wage records . Payroll E. Farm records . Electronic . Manual

Unit 4 - Labor Records.
Objective 11
List 7 items to be included in farm labor records.
	A. Types of farm labor records
	. Social Security
	. Income tax
	  . federal
	  . state
	. Workman's compensation
	. Time card
	. Statement of earnings
	. Wage records
	. Payroll
	. Incentives
	. Home

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion. B. Supervised study - Farm labor regulation and information (most current year). C. Question and answer session. D. Resource person from New York State Labor Department or Extension Agent.	A. Prepare a list of state and federal labor regulations that can affect student's employment on the home farm and when working on other farms or agri-business related areas of employment.	A. Written test on Objective 10.
A. Review records required. B. Class discussion of state and federal regulations. C. Supervised study period. D. Class discussion on all labor records required by law. E. Complete record samples.	A. Use classroom resources to compile information needed by students employed in agricultural work. B. Discuss the use and need for labor records. C. Compile copies of labor record forms.	A. Students will list five of the seven items included in farm labor records. B. Students will fill out all required farm labor records. Teacher will supply data and record forms.

OBJECTIVES BY UNIT	CONTENT
Objective 12 Demonstrate to the instructor's satisfaction your ability to complete farm labor records to comply with state and federal regulations.	A. Farm employee wage record B. Statement of farm worker earnings C. Farm employee time record D. Cornell Farm Account Record E. Cornell Computer Type Record
Unit 5 - Employer-Employee Relations. Objective 13 List 10 ways that a farmer can stimulate his labor force so that the force can be efficient, productive and loyal.	A. Items creating employee interest . Training - preparation to do job as employer wishes . Consistency . Title - Farm Manager, Farm Mechanic, Herdsman . Delegation of Authority . Wages - competitive, tangible . Working hours . House . Farm products - beef, milk . Incentives and involvements . Vacation periods
Objective 14 Make an incentive proposal for farm labor.	A. Purpose of plan B. Define the purpose C. Types of incentive . Production . Increase equity . Profit sharing D. Rewards

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FARM LABOR MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and class notes. B. Supervised practice. Filling out each record from example given. C. Discuss merits of each.	A. Complete each employee record form. B. Choose the types of records that you need to comply with state and federal regulations.	A. Teacher evaluation of completed record examples.
A. Lecture and student notes. B. Supervised study of reference articles in available magazines. C. Lead students in thinking reflectively regarding employer-employee relations. D. Discuss labor incentives. E. Discuss fringe benefits.	A. Compile a list of items which can be used to create employee interest and longevity. Select the ones that can be of most benefit to the student.	A. Teacher evaluation of the list.
A. Discussion of labor problems. B. Supervised study related to incentive plans. C. Guest speaker of a successful operation and his employee. D. Cite specific arrangements being used currently on local farms.	A. Preparation of sample incentive plans. B. Student evaluation of incentive plans.	A. Teacher evaluation of incentive program developed by the student for a given farm situation

MODULE OF INSTRUCTION

Title - FARM LABOR MANAGEMENT Code - 01.010404-01

RESOURCE MATERIALS

Books: Farm Management, Robertson (Lippincott 1958)
Profitable Farm Management, Hamilton & Bryant (Prentice Hall 1956)

Bulletins: Incentive Plans for Hired Men, Ag. Ext. 49
Farm Mgt. Handbook - Ag. Ext. Cornell
New York Econ. Handbook - Most current year
Farm Labor Regulations and Information - Most current year
Social Security Booklet - U.S. Govt. Printing Office

Periodicals: Local Daily and Weekly Newspapers
Hoards Dairyman
Farm Journal
Pennsylvania Farmer
Successful Farming
Doane's Agric. Report

Audiovisuals: Blank tapes for interviews

Youthpower contest is sponsored by the New York State Farm Bureau. All counties may enter the contest. See your county Farm Bureau President for details.

Farm Employee Wage Record

Employee

Name ______________________________

Address ______________________________

Social Security No. ______________________________

Electronic Account No. 32 _ _

Employer

Name ______________________________

Farm No. ______________________________
Electronic Accounting Farm Number

Show below the value of allowances provided regularly each payroll period, if claimed as part of the minimum wage.

Housing:		Utilities:		Food:		Other Benefits:
House	$	Electric	$	Meals (No.)	$	(List)
Apartment	$	Fuel	$	Milk (Qts.)	$	
Room	$	Gasoline	$	Eggs (Doz.)	$	
Other:	$	Other	$	Meat (Lbs.)	$	
	$		$	Other	$	

				Deductions			
Date	Total Hours Worked	Units Produced*	Gross Cash Wages	Social Security	Other (Write in)	Cash Paid	Comments

721

*Use for piece work only

Statement of Farm Worker Earnings

No.________

Employee:__________________________ Work Period:__________thru____________197_____

Total hours worked for period:__________ Number of units, if piece work:___________

Wages paid:		**Allowances:**	
Net cash wages	$________	House or lodging	$__________
		Electricity	$__________
Deductions:		Fuel	$__________
Social Security $_______		Meals_______	$__________
Other_________ $_______		Milk_______qts.	$__________
_____________ $_______		Eggs _______doz.	$__________
_____________ $_______		Other__________	$__________
			$__________
Total deductions	$________	_______________	$__________

GROSS CASH WAGES PAID $_________ +TOTAL ALLOWANCES $__________=$___________

(Wage rate $______per________) Total Wages

Employer:________________________________

- -

Statement of Farm Worker Earnings

No.________

Employee: ______________________ Work period: __________thru___________197______

Total hours worked for period: __________ Number of units, if piece work:_________

Wages Paid:		**Allowances:**	
Net cash wages	$________	House or lodging	$__________
		Electricity	$__________
Deductions:		Fuel	$__________
Social Security $_______		Meals _______	$__________
Other_________ $_______		Milk _______qts.	$__________
_____________ $_______		Eggs _______doz.	$__________
_____________ $_______		Other __________	$__________
		_______________	$__________
Total deductions	$________	_______________	$__________

GROSS CASH WAGES PAID $_________+ TOTAL ALLOWANCES $_________= $__________

(Wage rate $________per_________) Total Wages

Employer______________________________

FARM EMPLOYEE TIME RECORD

Employee ______________________ Week Ending ______________ 197____

Employer ______________________

Day of Week	Forenoon				Afternoon				Total Hours for the Day
	Start	End	Start	End	Start	End	Start	End	
Example	5:30	7:30	8.30	12:00	1:00	2:30	4:30	6:30	9
Monday									
Tuesday									
Wednesday									
Thursday									
Friday									
Saturday									
Sunday									

Total hours worked during week __________

____
Signature of Employee

LCC 66:80

TERMS OF EMPLOYMENT
FOR YOUR HIRED HELP
(Check Sheet)

	Yes	No	Comment
Output of products per man above average			
Wages above average			
Social Security			
Perquisites			
House			
Running water			
Central heating			
Electricity			
Telephone			
Fuel			
Milk			
Meat			
Eggs			
Fruit & vegetables			
Other ____________			
Incentive payments			
Regular working hours			
Vacation with pay			
Workmen's compensation insurance			
Health insurance			
Unemployment insurance			
Written agreement, annual review			

APPLICATION FOR FARM EMPLOYMENT*

Date ______

Name ______ Social Security No. ______

Address ______ Phone ______

FARM EXPERIENCE: No. of years ______ On what size and type of farms have you worked? (acres, kind of livestock, work done) ______

What type of work do you prefer? ______

Wage expected ______

LIST EMPLOYMENT OVER PAST THREE YEARS, STARTING WITH PRESENT JOB:

Date hired	Date left	Name of employer and address	Position and work done	Reason for leaving

Have you served in armed forces of U.S.A.? ______ from (date) ______ to (date) ______

Highest rank ______ Type of discharge ______

Are you registered for draft? ______ Address of local board ______

LIST THREE REFERENCES (not related to you)

Name	Address	Telephone No.

PERSONAL AND FAMILY INFORMATION:

Age ________ Are you: ( ) single ( ) married ( ) widower ( ) divorced ( ) separated

Height ____________ Weight ____________ White or colored? ____________

Were you raised on a farm? ________ Where? ____________ Father's name ____________

Was wife raised on a farm? ________ Where? ____________ Father's name ____________

Does your wife work outside of the home? ________ Type of work ____________

Names and ages of children ____________

____

Do other dependents live with you? ____________

Do you own your own household equipment and furniture? ____________

How many years of school did you complete? ________ Where? ____________

Have you ever farmed for yourself? ____________

Have you had any special training? ____________

____

Have you or your family any health problems? (Explain) ____________

____

____

Have you any physical defects? (Explain) ____________

____

Do you carry any hospitalization insurance? (Explain) ____________

____

What are your smoking habits? (Explain) ____________

What are your drinking habits? (Explain) ____________

Have you been arrested? (Explain, omit minor traffic offenses) ____________

____

What is your church affiliation? ____________ Member? ________

What is the approximate amount of your debts? $____________

How many dollars per week are you supposed to pay on debts? $____________

This space can be used for additional questions or comments: ____________

____

____

When would you be able to start work? ____________

Should the position be filled, do you wish to be advised if an opening exists later? ____________

PERSONAL INTERVIEW CHECK LIST*

(Reminder questions . . . to be used after the applicant has filled out application form.)

Interview with ______________________ Date ________

REASON FOR CHANGING JOBS:

- ______ low pay
- ______ poor house
- ______ employer hard to work for
- ______ wife's influence
- ______ poor equipment
- ______ long hours
- ______ no vacation
- ______ other ______________

If discharged, why? ______________________

FARM EXPERIENCE:

Which of the following equipment have you operated?

- ___ manure loader
- ___ manure spreader
- ___ plow
- ___ disc harrow
- ___ drag harrow
- ___ seed drill
- ___ corn planter
- ___ cultivator
- ___ sprayer
- ___ mower
- ___ rake
- ___ flail chopper
- ___ forage harvester
- ___ combine
- ___ corn picker
- ___ baler
- ___ blower
- ___ elevator
- ______________

Can you adjust a plow and set draft? ______________________

mount a cultivator on a tractor? ______________________

set a seed drill for rate of seeding and fertilizing? ______________________

set a corn planter for rate of seeding and fertilizing? ______________________

calibrate a sprayer? ______________________

What kinds of tractors have you operated, and how much experience have you had with each type? ______________________

____

DAIRY EXPERIENCE:

Do you like to work with dairy cattle? ______________________

Do you milk? __________ Machine __________ Hand __________

What type milking machines have you operated? ______________________

____

Breeds with which you have worked: ______________________

Size of herds: __________ Herd averages: __________

____

Have you worked with stanchioned herds? __________ Loose housing? __________

Can you balance a grain ration? __________ How do you determine rate of grain feeding?

____

How many pounds of milk should a good cow produce daily? ______________________

Have you operated a gutter cleaner? __________ silo unloader? __________

feed grinder? __________ automatic feeders? __________

OTHER EXPERIENCE:

Hogs: Do you like them? ______

What size hog enterprises have you worked with? ______

______

Your past duties with hogs: ______

______

Have you castrated pigs? ______ Tended at farrowing? ______

Poultry: Do you like working with chickens? ______

What size poultry enterprises have you worked with? ______

______

Your past duties with poultry: ______

______

Beef cattle: Do you like feeding steers? ______

What size beef operations have you worked with? ______

______

Your duties with beef cattle: ______

______

IF YOU WANT TO HIRE THIS MAN, you may want to reach agreement on the following:

Wage rate: ______ Overtime pay: ______

Extras: meat ______ milk ______

fuel ______ electricity ______

garden ______

Hours and conditions: ______

Vacation or time off: ______

Limits for employees' children: ______

Livestock, pets, or junk owned by employee: ______

Value of tenant house for rent: ______

Farm affairs must be private: ______

Days to vacate house at termination of employment ______

Notice to be given at termination: Employer: ______ Employee ______

REFERENCE CHECK LIST *

(A telephone call will often bring a more accurate appraisal of an applicant than a letter. The following questions can be put to a reference in 2 or 3 minutes. If you prefer to write, just clip one section and send to reference with a stamped, self-addressed envelope.)

Reference or employer: ______________________________ (name)

Did he miss much work? ________ Often late for work? ________ Was he dependable? ________

Have a temper? ________ Can he supervise other help? ________________

Good attitude? ________ Neat and orderly? ________ Would you rehire? ________

Did he like cows? ________ Was he a good worker? ________ Pay his debts? ________

Why did he leave? ________________ How much did you pay him? ________________

Did he take good care of his housing? ________________ Wife's attitude ________________

Reference or employer: ______________________________ (name)

Did he miss much work? ________ Often late for work? ________ Was he dependable? ________

Have a temper? ________ Can he supervise other help? ________________

Good attitude? ________ Neat and orderly? ________ Would you rehire? ________

Did he like cows? ________ Was he a good worker? ________ Pay his debts? ________

Why did he leave? ________________ How much did you pay him? ________________

Did he take good care of his housing? ________________ Wife's attitude ________________

Reference or employer: ______________________________ (name)

Did he miss much work? ________ Often late for work? ________ Was he dependable? ________

Have a temper? ________ Can he supervise other help? ________________

Good attitude? ________ Neat and orderly? ________ Would you rehire? ________

Did he like cows? ________ Was he a good worker? ________ Pay his debts? ________

Why did he leave? ________________ How much did you pay him? ________________

Did he take good care of his housing? ________________ Wife's attitude ________________

Reference or employer: ______________________________ (name)

Did he miss much work? ________ Often late for work? ________ Was he dependable? ________

Have a temper? ________ Can he supervise other help? ________________

Good attitude? ________ Neat and orderly? ________ Would you rehire? ________

Did he like cows? ________ Was he a good worker? ________ Pay his debts? ________

Why did he leave? ________________ How much did you pay him? ________________

Did he take good care of his housing? ________________ Wife's attitude ________________

* ADDITIONAL COPIES OF EMPLOYMENT FORMS *

The application for farm employment and personal interview check list forms were prepared in cooperation with dairy farmers in all parts of the United States. These forms are made available to Hoard's Dairyman subscribers at cost as another in many services to readers. A set of ten 6-page forms cost $1.15, including handling charges. If you order 50 sets the cost is $4.80; and 100 sets $9.25 .

Write:

READER SERVICE
HOARD'S DAIRYMAN
Fort Atkinson, Wisconsin

MODULE OF INSTRUCTION

Title - MARKETING FARM PRODUCTS Code - 01.010405-01

DESCRIPTION:

Agricultural products are marketed through local buyers, commission firms, cooperatives, auctions, and direct sales.

This module involves students in the study of the marketing procedures of advertising, grading, prices, and distribution. Students will be given an opportunity to select specific farm products and prepare a plan to market them.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Pricing and Promoting Farm Products	3	6
2. Functions of Marketing Agencies	3	10
3. Planning to Market Farm Products	1	7
	7	23

Revised April, '75

MODULE OF INSTRUCTION

Title - MARKETING FARM PRODUCTS

Code - 01.010405-01

OBJECTIVES to be obtained:

The student will be able to:

1. Correctly list a minimum of five sources of current farm marketing information.
2. Correctly list a minimum of seven factors affecting the price paid for farm products.
3. Correctly list a minimum of ten common means of promoting farm products.
4. Describe to the instructor's satisfaction, the functions performed by marketing cooperatives, inspection agencies, terminal auctions, commercial buyers, producers, and commission firms in marketing farm products.
5. Correctly list market grades and measures used to determine the grades, for five distinct farm products agreed upon by the instructor and student.
6. Prepare to the instructor's satisfaction a written plan of marketing a selected type of farm product including (1) production programs, (2) ages and weights marketed, (3) products marketed, (4) expected costs and returns, (5) five year past market history, (6) other pertinent information such as health regulations.

OBJECTIVES BY UNIT	CONTENT
Unit 1. Pricing and Promoting Farm Products Objective 1. Correctly list a minimum of five sources of current farm marketing information.	A. Sources of current farm marketing information . Radio reports . Newspaper reports . New York State crop reporting service reports . Farm magazines . Attending auctions and markets . Discussion with involved individuals . Reports from buyers and marketing cooperatives . Other

Objective 2.
Correctly list a minimum of seven factors affecting the price paid for farm products.
	A. Factors affecting prices paid for farm products
	. Supply and demand directly or indirectly determine all prices
	  . Law of Supply and Demand
	. Factors affecting supply and demand of farm products
	  . variations in yields
	  . seasonal expectations
	  . consumer income levels
	  . exports and imports
	  . substitutions
	  . government controls
	  . availability of product
	  . consumers taste changes
	  . form of the product
	  . quality of the product
	  . other
	. Methods of adjusting to price changes
	  . changing products produced
	  . changing production schedules
	  . changing marketing methods
	  . improving quality
	  . other

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to present information B. Student reporting	A. Take notes on new information B. Each student bring in at least one example of marketing information and report to the class. (If the report isn't written, the student may bring in a tape recording) C. Students should discuss each type of marketing information in terms of: . Timeliness . Accuracy . Availability . Other	A. Evaluate students' reports B. Written test
A. Lecture discussion to present law of supply and demand B. Group consensus to arrive at factors affecting demand and supply of farm products	A. Take notes on new information B. Use references to determine factors affecting supply and demand of products and report results to class C. Take part in group discussions	A. Written test

OBJECTIVES BY UNIT	CONTENT
Objective 3. Correctly list a minimum of ten common means of promoting farm products.	A. Costs and returns of advertising B. Methods of promoting farm products . Packaging . Newspapers, magazines, written advertisements . Television promotion . Radio promotion . Farm displays . Fair displays . Contests (princesses, queens, posters) . Billboards . Special festivals . Special days or weeks . Signs on vehicles . Special sales or offers . Other C. Effectiveness of various types of promotion
Unit 2. Functions of Marketing Agencies Objective 4. Describe to the instructor's satisfaction the functions performed by marketing cooperatives, inspection agencies, terminal auctions, commercial buyers, producers, and commission firms in marketing farm products.	A. Roles performed by: . Marketing cooperatives . Inspection agencies . Livestock auctions . Commercial buyers . Producers . Commission firms B. Examples of roles for a cooperative . Receive and assemble products . Process . Transport . Sell and buy . Distribute to members . Bargain . Grade . Advertise

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion presenting facts on costs and returns of advertising B. Student reporting C. Group consensus on types of farm product advertising in the area D. Guest speaker--co-op public relations person or person from advertising agency	A. Take notes on new information B. Students find examples of farm product promotion and bring evidence of each type to class C. Participate in group discussion to determine types of farm product promotion found locally D. Question guest speaker to determine effectiveness of various types of promotion	A. Evaluate student participation B. Written test
A. Students work in pairs to research roles performed by various agencies, and report their findings to the class B. Field trip(s) to one of agencies providing marketing services C. Filmstrip D. Guest speaker from one of marketing agencies	A. Work in teams to determine the roles of the various marketing agencies B. Students report findings to class C. Students record information during filmstrip, guest speaker, and/or field trip	A. Evaluate students' reports B. Written test

OBJECTIVES BY UNIT	CONTENT
Objective 5. Correctly list market grades and measures used to determine the grades for five distinct farm products agreed upon by the instructor and student	A. Grades and specifications for grades for farm products . Beef . Dairy . Poultry . Sheep . Swine . Forage crops . Fruits . Grain crops . Vegetables . Syrup . Lumber . Christmas trees
Unit 3 . Planning to Market Farm Products	
Objective 6. Prepare to the instructor's satisfaction a written plan of marketing a selected type of farm product including: . Production programs . Ages and weights marketed . Products marketed . Expected costs and returns . Five year past market history . Other pertinent information such as health regulations	A. Description and requirements of student's written plan B. Listing of available references that can be used by students

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion to introduce objective B. Student selection of grades each will study (minimum of five) C. Filmstrips used by group or individuals D. Supervised study E. Student reporting	A. Students can work individually or in small groups to obtain information on grading B. Report findings to group	A. Written test on grades and specifications
A. Lecture discussion to present information B. Supervised study-research C. Student reporting	A. Take notes on procedure to follow B. Prepare a farm marketing plan for a farm product or products agreed upon between the student and instructor C. Students report findings to class	A. Evaluate written plan B. Evaluate oral report to class

MODULE OF INSTRUCTION

Title - MARKETING FARM PRODUCTS   Code - 01.010405-01

RESOURCE MATERIALS

Books -

1. Profitable Farm Marketing. Snowden and Donahue, Prentice Hall. 1966.
2. The Farm Management Handbook. Hall and Mortenson, Interstate. 1960.
3. Farm Management Handbook. Cornell University. Latest Edition.

Bulletins -

Bulletins showing grades and requirements will be useful

Periodicals -

Any periodicals promoting farm products or listing current farm product prices

Audiovisuals -

Filmstrip - Cooperative organizations offering Producers services
Cal-State Polytechnic College, California

- Other filmstrips involving farm product grading
- Market reports

MODULE OF INSTRUCTION

Title - Marketing Livestock Products Code - 01.010405-02

DESCRIPTION:

Marketing livestock products is a complex activity. This module will provide the student with specific activities related to a specific type of livestock of principle concern to the student. The law of supply and demand will be studied as well as sources of information on marketing. The student will be involved in the preparation of a marketing report that will indicate past, present and future outlook.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Livestock Prices and Information	3	6
2. Livestock Marketing Agencies	2	4
3. Livestock Market Grades	1	5
4. Marketing Livestock Products	1	8
	7	23

Revised 4/75

MODULE OF INSTRUCTION

Title - Marketing Livestock Products

Code - 01.010405-02

OBJECTIVES to be obtained:

The student willbe able to:

1. Correctly indicate how the law of supply and demand affects price on a written test.
2. List within 10% the current market price for livestock and livestock products.
3. Correctly list five sources of current livestock marketing information.
4. Describe to the instructor's satisfaction, the role performed by marketing cooperatives, inspection agencies, livestock auctions, commercial buyers, producers, and commission firms in marketing livestock.
5. Correctly list the market grades for selected livestock and livestock products.
6. Prepare to the instructor's satisfaction, a written plan of marketing a selected class of livestock and products including: (1) production programs, (2) ages and weights, of marketing,(3) products marketed, (4) expected costs and returns,(5) five year market history.

Code - 01.010405-02

Title - Marketing Livestock Products

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Livestock Prices and Information Objective 1 - Correctly indicate how the law of Supply and Demand affects price, on a written test.	A. Effects on price as supply and demand changes in a free market system. B. Other factors affecting price. . Quality . Market regulations . Taxes . Processing . Transportation . Storage
Objective 2 - List within 10% the current market price for livestock and livestock products.	A. Understanding market price reports. B. Learning current market prices

01.010405-02 - Code

Marketing Livestock Products - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture discussion Supervised study Student reporting	A. Take notes on new information. B. Students find examples of how supply and demand has affected prices of livestock and livestock products. C. Students report their findings to the class.	A. Evaluate students report. B. Written test.
Lecture discussion Supervised study Field trip	A. Students take notes of new information P. Students record prices during a field trip to a livestock auction or stockyards. C. Students study prices D. Written test on prices during an established time	. Written test on prices. 10% range should be allowed.

Code - 01.010405-02

Title - Marketing Livestock Products

OBJECTIVES BY UNIT	CONTENT
Objective 3 - Correctly list five sources of current livestock marketing information.	. Sources of current livestock marketing information. . Radio reports . Newspaper reports . New York State crop reporting service reports . Breed journals and farm magazines . Attending livestock auctions . Questioning individuals concerned with livestock marketing . Reports from buyers and marketing cooperatives.
Unit 2 - Livestock Marketing Agencies Objective 4 - Describe, to the instructor's satisfaction, the roles performed by marketing cooperatives, inspection agencies, livestock auctions, commercial buyers, producers, and commission firms, in marketing livestock products.	. Roles performed by: . Marketing Cooperatives . Inspection agencies . Livestock auctions . Commercial buyers . Producers . Commission firms

EDUCATION

01.010405-02 - Code

Marketing Livestock Products - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture discussion Supervised study Student reporting	A. Take notes on new information. B. Students find examples of how supply and demand has affected prices of livestock and livestock products. C. Students report their findings to the class.	A. Evaluate students report. B. Written test.
Lecture discussion Supervised study Field trip	A. Students take notes of new information P. Students record prices during a field trip to a livestock auction or stockyards. C. Students study prices D. Written test on prices during an established time	. Written test on prices. 10% range should be allowed.

Code - 01.010405-02

Title - Marketing Livestock Products

OBJECTIVES BY UNIT	CONTENT
Objective 3 - Correctly list five sources of current livestock marketing information.	. Sources of current livestock marketing information. . Radio reports . Newspaper reports . New York State crop reporting service reports . Breed journals and farm magazines . Attending livestock auctions . Questioning individuals concerned with livestock marketing . Reports from buyers and marketing cooperatives.
Unit 2 - Livestock Marketing Agencies Objective 4 - Describe, to the instructor's satisfaction, the roles performed by marketing cooperatives, inspection agencies, livestock auctions, commercial buyers, producers, and commission firms, in marketing livestock products.	. Roles performed by: . Marketing Cooperatives . Inspection agencies . Livestock auctions . Commercial buyers . Producers . Commission firms

E D U C A T I O N

01.010405-02 - Code

Marketing Livestock Products Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture Discussion Student reporting	A. Take notes on new information B. Each student bring in at least one example of the market reports, and report his findings to the class. (If the report isn't written he may wish to bring in a tape recording.)	A. Evaluate students report B. Written test
Lecture discussion Supervised study Student reports Filmstrip Guest speaker Field trip	A. Take notes on new information B. Work in teams to determine the roles of the various marketing agencies. C. Students report findings to the class. D. Take notes of information during guest speaker, field trip, or filmstrip.	A. Evaluate students reports B. Written test on roles of marketing agencies.

Code - 01.010405-02

Title - Marketing Livestock Products

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Livestock Market Grades Objective 5 - Correctly list the market grades for selected livestock and livestock products.	. Livestock and livestock product grades and brief descriptions . Milk classes . Steer and heifer grades . Slaughter grades for cows . Slaughter grades for bulls . Calf grades . Purebred dairy classification . Sheep grades-hothouse, spring, yearling,mutto . Wool grades . Hog grades . Poultry grades . Egg grades
Unit 4 - Marketing Livestock Products Objective 6-Prepare to the instructor's satisfaction a written plan of marketing a selected class of livestock and products including: . Production programs . Ages and weights when marketed . Products marketed . Expected costs and returns . Five year market history	A. Description and requirements of written plan B. Listing of available references that can be used

EDUCATION

01.010405-02 - Code

Marketing Livestock Products - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture discussion Filmstrips Supervised study Student reporting	A. Students take notes of new information B. Each student or team of students finds grades and descriptions for assigned livestock C. Students report findings to the class	. Written test on grades
Lecture Discussion Supervised study Student reporting	A. Take notes of procedures to follow B. Prepare a livestock marketing plan for selected livestock and products C. Report finished plan to class	A. Evaluate plan B. Evaluate report made by student

MODULE OF INSTRUCTION

Title - Marketing Livestock Products Code - 01.010405-02

RESOURCE MATERIALS

Books: Profitable Farm Marketing . Snowden and Donahoo, Prentice-Hall 1966

Bulletins: Farm Management Handbook . Cornell U., Latest Edition

Audiovisuals -

Filmstrip -
Cooperative Organizations Offering Producers Services -
California State Polytechnic College
San Luis Obispo, California

SAMPLE QUIZ

Marketing Livestock Products

Indicate whether price increases, remains the same, or decreases for each of the following:

1. Supply increases as demand remains the same.
2. Demand increases as supply increases.
3. Demand increases as supply decreases.
4. Supply decreases as demand remains the same.
5. Supply decreases as demand decreases.
6. Supply increases faster than demand.
7. Demand decreases as supply increases.
8. Supply increases slower than demand.
9. Supply decreases slower than demand.
10. Supply and demand remain the same.

2. Indicate the current market price for each of the following. 10% error allowed.

Choice steers -
Choice calves -
U.S. No. 2 butcher hogs -
Choice lambs -
Handling dairy cows -
Grade A medium eggs -
Dairy slaughter cattle -
Boars -
Slaughter ewes -
Feeder pigs (each) -

3. List six sources of current livestock marketing information.

1.

2.

3.

4.

5.

6.

SAMPLE QUIZ

Marketing Livestock Products

List the market grades for each of the following:

1. Milk classes with description
    1.
    2.
    3.
    4.

2. Steer and heifer grades
    1.
    2.
    3.
    4. Standard
    5.
    6. Utility
    7.
    8. Canned

3. Meat Birds
    1.
    2.
    3.
    4.

4. Swine Grades
    1.
    2.
    3.
    4.
    5. Cull

5. Lamb Grades
    1.
    2.
    3.
    4.
    5.

6. Egg Grades
    1.
    2.
    3.
    4.

7. Holstein classification
    1.
    2.
    3.
    4.
    5.
    6.

MODULE OF INSTRUCTION

Title - Starting A Farm Business Code - 01.010406-01

DESCRIPTION:

The selection of a farm enterprise is based largely on the types of land available, market outlets in the area, and the interests and skills of the owner. Following the selection of the farm enterprise, students are involved in the selection of suitable farms with proper elevation, topography, adequate acreage, and buildings to meet the farm needs. Upon selection of a farm, students enrolled in this module will develop skills in the selection of credit sources and how to maintain good ratings. Students will also become involved in methods that can be used to become established in a farm business. Students will select enterprises that should be successful when given specific land resources.

Divisions or Units of Content	Time Allocations	
	Class	Other
1. The Selection of a Farm	4	2
2. Ways of Getting Established in Farming	2	2
3. Obtaining Financial Backing and Establishing Credit	3	9
4. Long Range Planning for Future Land, Buildings, Machinery and Livestock Needs	4	4
	13	17

Revised June '75

MODULE OF INSTRUCTION

Title - Starting A Farm Business

Code - 01.010406-01

OBJECTIVES to be obtained:

The Student Will Be Able To:

1. Using class references, list and define the four major factors influencing the selection of a farm enterprise.
2. Given a situation, select and justify to the instructors satisfaction, enterprises for a farm business based on the four major selection factors studied in class.
3. Given references, develop a complete check list of the factors to consider in selecting a farm.
4. Using the check list developed in class, evaluate to the instructor's satisfaction, three farms in terms of factors on the list.
5. Using information supplied from the field trips outlined in objective 4, select and justify to the instructors satisfaction, the best one of the three farms in terms of the check list developed in objective 3.
6. Using references supplied by the instructor, select, describe and compare five different ways of becoming established in farming.
7. Using information developed in objective 6 (with references supplied as needed), select and justify to the instructors satisfaction, the one way of acquiring ownership best suited to his situation.
8. Given a situation, determine the types and amounts of machinery and livestock needed to operate a farm business.
9. For a given situation, calculate the capital needed for purchasing machinery, livestock and real estate for starting a farm business - using reference material supplied by the instructor.
10. Using references supplied by the instructor, identify and define the types of credit available for use in starting a farm business.
11. Using reference material, select four sources of credit and determine what sources to use for short term and long term credit.
12. Using references assigned in class, and for a given situation, prepare an outline showing anticipated expansion plans for the future in terms of land, buildings, machinery and livestock.

Co - 01.010406-01

Title - Starting A Farm Business

OBJECTIVES BY UNIT	CONTENT
Unit 1 - The Selection of a Farm. Objective 1 Using class references, the student will list and define the 4 major factors influencing the selection of a farm enterprise.	A. Definition of a farm enterprise B. Factors in selecting a farm enterprise . Types of land available . soil productivity . acreage . Market outlets . Economic considerations . Intensive in providing sufficient productive man work units. . Comparative return per unit of enterprise. . Personal interests and skills.
Objective 2 **Given a situation, select** and justify to the instructors satisfaction, enterprises for a farm business based on the 4 major selection factors studied in class.	A. Types of enterprises. . Livestock . cows . heifers . hens . chicks . beef . sheep . swine . other . Field crops . forage . corn-silage . corn-grain . small grains . other . Cash crops and fruit. . apples . cherries . grapes . potatoes . snap beans for processing . other B. Situation - Select enterprises necessary to provide work for 2 men for a farm that produces a product marketable in New York (in area selected) with description of acreage and type of land - instructors choice. Assume buildings are sufficient for the enterprises selected and that markets are available.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion--use of blackboard & supervised study B. List 10 major and 10 minor enterprises in New York State Discuss each enterprise and possible combinations.	A. Take note as outlined by instructor B. Break up into groups of four for discussion of an assigned factor; report findings to class. C. Each student will receive written definitions of 4 factors.	A. Students will list the four major factors influencing the selection of farm enterprises,
A. Class discussion--chalk and board B. Field trip - with field trip guide - list of questions. Visit two farms with differing combination of enterprises Suggestions: . Dairy farm . Poultry farm . Heifer raising farm . Cash crop farm C. Supervised study	A. Take note as outlined by instructor B. Field trip: . Students ask questions assigned by instructor from list developed in class. . Take notes to be used in writing a report on selection of enterprises for the situation outlined under Content B C. Write report of enterprises selected based on situation given. Students present reports in class and lead discussion.	A. Upon completion of a field trip students will write a report on the enterprises of the farms visited. Students will comment on the enterprises and make any recommendations for changes. B. Students report discussed in class. The instructor will base the grade on 50% written report and 50% for discussion and answering questions.

Code - 01.010406-01

Title - Starting A Farm Business

OBJECTIVES BY UNIT	CONTENT
Objective 3 Given references, develop a complete checklist of the factors to consider in selecting a farm.	A. Factors to consider in selecting a farm . Acreage . Location . Climate . Topography . Soils . Timber . Layout . Water supply . Residences . Barns . Other B. Farm Buildings
Objective 4 Using the checklist developed in class, evaluate to the instructors satisfaction, three farms in terms of factors on the list.	A. Type of farms to evaluate . Farm with limited potential . limited due to size, productivity of land, other; may be no longer in commercial farming and might be purchased for a comparatively low price. . Farm with average potential . farm about average in size and productivity . Farm with excellent potential . farm above average in size; well managed
Objective 5 Using information supplied from the field trips outlined in Objective 4, select and justify to the instructors satisfaction, the best one of the three farms in terms of the checklist developed in Objective 3.	A. A farm with limited potential B. A farm with average potential C. A farm with excellent potential

01.010406-01 - Code

Starting A Farm Business - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Use of blackboard & chalk C. Supervised study	A. Student will develop on paper a checklist - using information supplied by teacher.	A. Short quiz Given 5 of the facts from the checklist - explain how they effect the success or failure of a farm.
A. Field trips with students taking notes. B. **Class discussion**	A. Students fill out checklists provided by instructor for each farm visited. If possible get the value of each farm (what they would be worth if sold) market value. B. Students visit town clerk office and look up assessments and taxes paid by the farmers.	A. Students written evaluation sheets of 3 farms discussed in class and on field trips.
A. Class discussion (with emphasis on points to consider when buying a farm) B. Supervised study C. Student oral reports	A. During discussion - students answer questions asked by the instructor regarding the 3 farms. B. Write a report indicating the farm he would select and why. Also include any modifications.	A. Grade based on oral answers. B. Written report on farm selected - with reasons and any recommendations regarding limitations.

Code - 01.010406-01

Title - Starting A Farm Business

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Ways of Getting Established in Farming Objective 6 Using references supplied by the instructor, describe and compare five different ways of becoming established in farming.	A. Ways of getting established in farming . Inheritance or gift . birth . marriage . Use of savings from non-farm work . Agricultural ladder . Father - son partnerships . Use of borrowed funds . Contract farming . Corporation shares
Objective 7 Using information developed in objective 6 (with references supplied as needed), select and justify to the instructors satisfaction, the one way of acquiring ownership best suited to his situation.	A. Factors influencing the way of getting started in farming . Presence of the 7 types in the community . Resources of student . money available . equity in livestock & machinery . Type of enterprises selected . Personal preferences
Unit 3 - Obtaining Financial Backing and Establishing Credit Objective 8 Given a situation, determine the types and amounts of machinery and livestock needed to operate a farm business.	A. Machinery needs and values . New . Used B. Livestock . Cows . Heifer replacements C. Crops needs . 60 acres hay . 40 acres corn for grain . 40 acres corn for silage

01.010406-01 - Code

Starting A Farm Business - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. **Class discussion** B. **Supervised study** C. Teacher could cite examples of how some young and adult farmers become established in the school district.	Students will use the references and write down and explain 5 ways of getting started in farming. Have the student report on one of the 5 ways to the class.	Written report of 5 ways of getting established in farming.
A. **Class discussion** B. Supervised study.	A. Involve students in discussion by asking for examples of neighbors or relatives who have started a farm business. B. Using problem solving method have student develop a written plan showing how he might get started in farming.	A. Basis of discussion in class (Bonus points) B. Student will turn in a written report explaining a way he might get started in farming. And the reasons for his method.
A. **Class discussion** B. Supervised study. C. Teacher use several examples in the community where farms are overstocked, machinery & equipment investments are too large. Cite examples where size of herd, machinery and equipment are in balance.	A. With guidance from the instructor, the student will develop a written list of machinery and livestock (type and amount) for the farm situation given.	A. Student reports will be discussed in class. B. Students will have the option to set up an ideal farm outlining cow heifers, replacements, cropping acreage, machinery, & equipment inventory for a specific Farm Business. C. The class and the insturctor will ask the student questions on his Ideal Farm.

Code - 01.010406-01

Title - Starting A Farm Business

OBJECTIVES BY UNIT	CONTENT
Objective 9 For a given situation, calculate the capital needed for purchasing machinery, livestock and real estate for starting a farm business using reference material supplied by the instructor.	A. Capital required . Machinery . new . used . Livestock . Real estate
Objective 10 Using references supplied by the instructor, identify and define the types of credit available for use in starting a farm business.	A. Types of credit . Merchants or dealers . Individuals . Commercial banks . Insurance companies . Production credit association . Farm and home administration . Federal land bank
Objective 11 Using reference material, select 4 sources of credit and determine what sources to use for short term and long term credit.	A. Uses of credit . Real estate mortgage - long term credit . amount . annual . Non - real estate credit - short term credit . amount . annual interest Situation - Real estate mortgage for $25,000 Non Real estate loan for $20,000

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Blackboard C. Supervised study . Use published prices from auctions . Have farm machinery dealer speak to students on machinery and equipment needs and prices.	A. Have the students contact resource person to obtain prices for all items in Objective 9.	A. Students will prepare an inventory on all items in Objective 9. B. Prices will be calculated for all items, grades will be determined by completeness and accuracy of the inventory.
A. Supervised study B. Guest resource person . Production credit representative . Local banker	A. Using reference material the students will write and explain the types of credit that he would use in becoming established in a farm business.	A. Students will be given a written exam on the types of credit. B. Students will select the sources of credit for short term and long term capital.
A. Class discussion B. Use of blackboard C. Supervised study D. Work out interest cost for various types of loans.	A. Student will work out a problem given by instructor to learn how to figure interest. Calculate the interest for the given situation. . Short term . Long term . Discounts	A. Written exam on sources of credit. B. Written exam on interest calculations.

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Long range planning for future land, buildings, machinery and livestock needs. Objective 12 Using references assigned in class, and for a given situation, prepare an outline showing anticipated expansion plans for the future in terms of land, buildings, machinery and livestock.	A. Factors to consider . Future plans . partnership or single ownership (one or two families to support) . Anticipated rising costs . Planned growth - expansion . Outlook for enterprises in the future B. Factors related to: . Land . Buildings . Machinery . Livestock

01.010406-01 - Code

Starting A Farm Business - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Class discussion B. Supervised study . Land . Buildings . Machinery . Livestock C. Student oral reports	A. The student will, after proper orientation, use references to outline a plan for the future for given situation in terms of four factors listed under content. B. Student will give an oral report to the class regarding future plans. C. Students will make out written outlines to complete the requirements of Objective 12.	A. Student will turn in the written report. (Basis for oral report) B. Instructor will evaluate oral and written reports for a grade and make constructive comments regarding the reports.

MODULE OF INSTRUCTION

Title - Starting A Farm Business Code - 01.010406-01

RESOURCE MATERIALS

A. Books-
Teacher References.

Hamilton, James E., & Bryant, W.R., Profitable Farm Management, Prentice-Hall, Inc., 1963, 394 pps. $8.44

Student References.

Chastain, E.D., Yeager, Joseph H., McGraw, E.L., Farm Business Management, Auburn Printing Company, 1962, 175 pps. $2.50

B. Bulletins
Teacher References.

A.E.Ext. 440 Farm Management Handbook, 148 pps.
A.E.Ext. 571 Agricultural Situation and Outlook, 110 pps.
A.E.Res. 163 Credit Used by New York State Dairymen, 51 pps.
A.E.Res. 292 A Regional Summary Of United States Farming, 78 pps.

Student References.

A.E.Ext. 568 Buying a Farm on Contract 15 pps.
A.E.Ext. 331 The Financial Lease 12 pps.
A.E.Res. 332 Dairy Farm Management 36 pps.
A.E.Res. 308 Farm Cost Accounts - Field Crops, 18 pps.
A.E.Res. 309 Farm Cost Accounts - Cash Crops & Fruit 19 pps.
A.E.Res. 310 Farm Cost Accounts - Livestock 13 pps.
Leaflet No. 432 USDA Where and How to Get a Farm 7 pps.
Principles of Agricultural Finance, Farm Credit Service 64 pps.
A.E.Ext. 517
A.E.EXt. 497 1967 Beef Summary 14 pps.
A.E.Ext. 514 1967 Sheep Summary
E861 Farm Partnership Arrangements 15 pps.
E1016 Incorporation of the Farm Business 19 pps.
Toward the Year 1985 - No. 1 Milk Production and Consumption 22 pps.
Toward the Year 1985 - No. 2 Field Crops 25 pps.
Toward the Year 1985 - No. 3 Sheep, Hogs and Beef 12 pps.
Toward the Year 1985 - No. 7 Fruit Production & Utilization 25 pps.
toward the Year 1985 - No.10 Capital & Labor 18 pps.

C. Audio - Visuals

An Economic Classification of Farms by Areas - Map
Soil Maps - Local Soil Conservation Office

MODULE OF INSTRUCTION

Title - REORGANIZING A FARM BUSINESS Code 01.010406-02

DESCRIPTION:

Student will study problems in the farm business and the making of adjustments to them. Farm production, size, labor efficiency, enterprise emphasis and capital distribution are principal indicators of farm business efficiency and productivity.

Following an evaluation of the farm enterprise, the student will develop a list of priorities for improving the factors limiting business. Decisions affecting the future of the farm operations will be based on efficiency of management, changes in farm technology and of labor availability.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Identify Resources Available to the Farmer	2	6
2. Evaluating the Farm Enterprise and Identifying Problem Areas	6	2
3. Establishing Priorities to Correct Business Deficiencies	6	2
4. Planning for Future Business Change	4	2
	18	12

Revised June 1974

MODULE OF INSTRUCTION

Title - REORGANIZING A FARM BUSINESS

Code - 01.010406-02

Objectives to be obtained:

The student will be able to:

1. List four resources available to farmers and discuss the importance of each resource.
2. Given a local situation with specific resources available to the farmer, explain how these resources are interrelated and can affect a farm business.
3. Correctly enter and tally one month's expenses and receipts using the Cornell Farm Account Book.
4. List the assets and liabilities of a given farm business.
5. Locate production levels in a given farm business using the Cornell Farm Business Chart.
6. Make a list of factors that will affect change in a farm business. Make priority rankings for the farm business.
7. Given a farm business problem, list, to the teacher's satisfaction, the areas requiring change and the ways you would go about introducing changes.

Code - 01.010406-02

Title - REORGANIZING A FARM BUSINESS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identify Resources Available to the Farmer. Objective 1 List four resources available to farmers and discuss the importance of each resource.	A. Resources available to the farmer . Land . Capital . Buildings . Labor . Management . Markets
Objective 2 Given a local situation with specific resources available to the farmer, explain how these resources are interrelated and can affect a farm business.	A. Resources . Land . Capital . Buildings . Labor . Management . Markets

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use resource people to speak to the class regarding resources . SCS . Bankers . Marketing personnel B. Overhead projector transparencies on all resources. C. Filmstrips on resources. D. Class discussion on soils classification. E. Study a soils map of a farm in the school district. F. Field trip to discuss land classes.	A. Students will list the types of agricultural enterprises that could be carried out in a given area determined by the resources available. B. Set up a soils judging contest tied into the unit so that students could appreciate the value of land as one of our basic resources. C. FFA land judging contest on the local, district, state, and national levels.	A. Students will list four resources available to farmers and briefly explain the importance of each resource listed. Essay question.
A. Provide students with sample farms, listing all resources available. B. Have students study and analyze the farm including resources. C. Students discuss how the resources are being handled and other alternatives that can improve the farm business.	A. Students could study the resources available and list the types of farming enterprises that could be profitable in a given area. B. Students could explore alternate uses of resources if limitations exist for agricultural purposes.	A. Given a set of conditions related to resources prepared by the teacher the student will make a list of major agricultural enterprises that could be successfully carried out. List reasons for enterprises selected. B. Students will give oral reasons why specific enterprises are not found in the local area. C. Students will list the problems that develop when markets are lost and how this influences other enterprises.

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Evaluating the Farm Enterprise and Identifying Problem Areas. Objective 3 Correctly enter and tally one month's expenses and receipts using the Cornell Farm Account Book.	A. Expense account for one month in the Cornell Cash Account Booklet . Labor . Feed . Oil and gas . Breeding fee . Vet expenses . Other expense items B. Receipts for one month . Milk sold . Crops sold . Culled cows . Calves . Other possible receipts
Objective 4 List the assets and liabilities of a given farm business.	A. Assets B. Liabilities C. Inventory D. Net worth

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Pass out handout sheet on farm business expenses and receipts for a month. B. Supervised study. C. Class discussion.	A. Have students fill out pages two and three of the Cornell Cash Account Booklet and have student correctly tally one month's expenses. Do this in a lab session.	A. Check cash account booklet to see if information is entered correctly and tallied correctly.
A. Invite extension agent or a banker as a speaker to discuss the importance of keeping an accurate farm inventory. B. Class discussion led by the instructor on how to interpret and use asset-liability data to make sound farm management decisions. C. Supply students with Cornell Farm Inventory Books. Explain the purpose of and methods used to take a farm inventory. D. Complete net worth statement of a sample farm.	A. Students ask questions on the value of an inventory. B. Students take an inventory on the home farm or cooperative farm.	A. Students will be graded on a written test prepared on objective. B. Grade the student on Farm Inventory Book project. C. Written quiz on farm inventory and net worth statement of an operating farm.

Code - 01.010406-02

Title - REORGANIZING A FARM BUSINESS

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Establishing Priorities to Correct Business Deficiencies. Objective 5 Locate production levels in a given farm business using the Cornell Farm Business Chart.	A. Farm Business Chart . Levels of production . Mean or average levels of production in New York State . Farm production indexes: pounds of milk produced per man, pounds of milk produced per cow and labor income, and other comparative evaluations.
Unit 4 - Planning for Future Business Change. Objective 6 Make a list of factors that will affect change in a farm business. Make priority rankings for the farm business.	A. Crop efficiency B. Livestock efficiency C. Labor and equipment efficiency D. Farm Business Chart . Areas of strength . Areas of weaknesses . Recommended changes
Objective 7 Given a farm business problem, list, to the teacher's satisfaction, the areas requiring change and the ways you would go about introducing changes.	A. Farm business problem . Read and analyze . Establish alternatives . Reasons for choosing alternatives

EDUCATION

01.010406-02 - Code

REORGANIZING A FARM BUSINESS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Pass out latest farm business chart and a farm business handout for a given farm business. Use overhead projector to show students where to locate production levels and to calculate indexes. B. Use sample farms in the school district for class discussion. C. Prepare students for a farm visit. Spell out the purpose of the farm visit.	A. Students will individually calculate man work equivalents, man work units, production per man, production per cow, gross income per cow and labor income. B. Field trip report.	A. Check on each student to see if they are making calculations correctly. B. Written exam on calculations. C. Field trip report grade.
A. Farm visit. Pass out farm business chart to have students fill out while on farm visit. Be sure that the farm visited has current, accurate figures available for the students. B. Supervised study of efficiency factors.	A. Students make an analysis of the farm business or a sample farm for extra credit and FFA contest. B. Students ask questions using the farm business chart as a guide. C. Students fill out farm business chart.	A. Day after visit students review farm business chart, calculate indexes. Written report. B. Make recommendations to improve the farm business. The grade will be determined by the quality of the report and supportive reasons for recommendations.
A. Teacher gives the student a given problem related to a farm business. B. Students prepare oral reports that will identify problems and alternatives. C. Classroom discussion led by student giving report.	A. Student analyzes problem and calculates indexes. Makes recommendations. B. Students compare a report on the home farm or cooperative farm business.	A. Student is graded on completed module packet. B. Letter grade is given on the basis of a written exam and oral presentation.

MODULE OF INSTRUCTION

Title - **REORGANIZING A FARM BUSINESS** Code - 01.010406-02

RESOURCE MATERIALS

Books

Profitable Farm Management	Hamilton and Bryant, 2nd Ed., 1963
Profit Maximizing Principles	OSU 1970 (Cornell IMS)

Booklets

Planning A Profitable Farm Business, Cornell IMS
Agricultural Business Management, Principles That Affect Production Cornell IMS

Audiovisuals

Farm Management Film Series, Cornell Film Library, 3 films, 45 min. each
Agricultural Resources in New York State, Cornell Film Library, 35 min.

Other

Class visit to a farm business
Class visit by a banker
Farm business problems made up by teacher

Note: The Cornell Farm Business Chart and a Farm Business Problem are included in this module as a part of the unit, however, a teacher may set up his own farm business problem.

FARM BUSINESS CHART

FARM OF ______________________________ YEAR ____________

TOTAL ACRES IN THE FARM ____________________ ACRES OF TILLABLE LAND ____________

Success in farming is the result of many factors. Farm business studies show that the most important factors under the farmer's control are size of business, production rates of crops and animals, labor efficiency and selection of enterprises.

The chart below shows the range of the experience of commercial farmers in New York with respect to size of business, production rates and labor efficiency.

The figure at the top of each column is the median of the highest ten per cent of the farms in that factor. For example, the figure 3.8 at the top of the column headed "Tons of Hay" is the median of the ten per cent of the farms with the highest yield of hay. The other figures in the column are the medians for "the next best 10 per cent," "the 10 per cent below that," and so forth. The figure 1.2 at the bottom of the column is the median of the ten per cent of the farms with the lowest yield of hay.

Each of the columns is independent of the others. The figure 22 at the top of the column headed "Tons of Corn Silage" is the median of the ten per cent of the farms with the highest yield of corn silage.

Hay, Silage, Grain Yields per Acre					Vegetable Yields per Acre							Fruit Yields per Acre			
Tons of Hay	Tons of Corn Silage	Bu. of Corn	Bu. of Oats	Bu. of Wheat	Lbs. of Dry Beans	Cwt. of Potatoes	Tons of Cabbage	Cwt. of Onions	Tons of Tomatoes	Net Tons of Sweet Corn	Tons of Snap Beans	Bu. of Apples	Bu. of Pears	Tons of Grapes	Tons of Sour Cherries
3.8	22	120	92	58	2,300	340	32	470	23	5.0	2.8	540	330	7.5	6.6
3.0	19	100	80	52	1,900	305	26	410	19	4.4	2.5	480	260	6.0	4.6
2.7	17	90	70	47	1,700	285	23	370	17	3.9	2.3	430	230	5.5	3.6
2.4	16	83	65	44	1,500	265	20	345	15	3.7	2.1	390	200	5.0	3.0
2.2	15	78	60	41	1,300	250	18	320	14	3.5	1.9	355	180	4.6	2.6
2.1	14	73	56	39	1,100	240	16	300	13	3.3	1.8	325	160	4.2	2.3
1.9	13	65	52	37	1,000	225	14	280	12	3.1	1.7	295	140	3.8	2.0
1.7	12	55	48	34	900	205	12	250	11	2.8	1.5	260	120	3.4	1.6
1.5	11	45	40	30	800	185	10	220	10	2.3	1.3	220	100	3.0	1.2
1.2	8	30	30	25	600	150	8	170	9	1.5	1.1	180	70	2.5	0.8

Dairy Farms					Labor			Poultry Farms				
Number of Cows	Pounds of Milk Sold	Pounds Milk Sold per Cow	Cows per Man	Pounds of Milk Sold per Man	Total Work Units	Man Equivalent	Work Units per Man	Number of Hens	Eggs Sold per Hen	Hens per Man	Dozens of Eggs Sold per Man	Pounds Feed per Dozen Eggs
95	1,000,000	14,500	38	475,000	1,000	3.5	420	55,000	250	12,000	240,000	4.0
60	640,000	12,500	32	350,000	720	2.7	340	30,000	235	9,500	175,000	4.3
50	530,000	11,500	28	300,000	590	2.3	310	20,000	225	7,500	125,000	4.6
42	450,000	10,900	25	260,000	520	2.0	290	16,000	220	6,000	100,000	4.7
39	400,000	10,300	23	230,000	460	1.8	270	12,000	217	5,000	85,000	4.8
36	355,000	9,700	21	210,000	430	1.6	250	9,500	214	4,000	75,000	4.9
32	315,000	9,000	20	190,000	390	1.4	230	7,000	210	3,500	65,000	5.0
28	265,000	8,100	19	175,000	350	1.3	210	5,200	205	3,000	55,000	5.2
24	210,000	7,200	17	160,000	310	1.2	190	4,000	200	2,500	45,000	5.4
20	150,000	6,000	14	120,000	250	1.0	160	3,000	185	2,000	35,000	5.8

HOW TO USE THIS CHART

Draw lines in each column to show the rank of the farm business being studied. For example, if the farm produced 57 bushels of oats per acre draw a line in the "oats" column between the 56 and 60.

Draw heavy lines so that you can see them easily.

Do not draw lines for factors which are of only minor importance on the farm being studied.

PREPARED BY S. W. WARREN, DEPARTMENT OF AGRICULTURAL ECONOMICS, NEW YORK STATE COLLEGE OF AGRICULTURE, ITHACA, NEW YORK, FEBRUARY, 1970

INTRODUCTION and INSTRUCTIONS

Everyone of us is challenged to improve his managerial ability. This means developing our skills in making good business decisions. This problem is designed to give you practice in analyzing a farm business and in thinking through some of the choices open to a farmer and his son.

Information about a farmer and his family and the home farm is given in this booklet. Several choices are being considered. After you have studied this information, your teacher will supply you with an entry blank on which you may indicate your evaluation of the four alternatives.

By

C.A. Bratton E.L. LaDue

C.W. Loomis, G.J. Conneman
Cornell Agr. Ext. Dept.

THE FAMILY and THE FARM

The Family

Gary Lane is 18 years old and a freshman in the Agricultural and Technical College. He took vocational agriculture in high school. Two years ago, Gary decided that he wanted to farm when he completed his education.

Gary's father is 44 years old and in excellent health. He bought the "home" farm of 120 acres on contract in 1949. In 1958, they bought a 69 acre farm across the road. Mr. Lane is active in farm organizations.

Mrs. Lane, who is a business institute graduate, keeps the farm records. She is active in the local 4-H Club and the PTA. Only in emergencies does she help with the farm work.

Gary has an older sister who will graduate from college in June. She plans to be a teacher. A younger sister is a freshman in high school.

The Lane's goal is to operate a farm business that will enable them to have a comfortable home, educate the children, and take part in community affairs.

The Farm

The farm, which was formerly two units, consists of 189 acres with 150 tillable. The soil is in the Honeoye-Lima association. The barn on the home farm, built in 1939, was remodeled inside in 1960 and now has stanchions for 40 cows; heifer and calf pens; a box stall; and a 12 x 14 milk house. There is a 16 x 50 concrete silo.

The 34 x 60 barn across the road has 20 wood stanchions, horse stalls, calf pens, and a 12 x 30 wood silo. The house is in good repair and has been rented by the same family since 1960.

The Labor Force

Mr. Lane has always done most of the work himself, only hiring day help during the summer. Since Gary started in high school, the two of them have done all the work.

The Machinery

Major items include one small and two large tractors, a truck, baler, chopper, hay conditioner, an elevator, grain combine, gutter cleaner, silo unloader, a ten-can cooler, and the usual tillage and dairy equipment.

The Livestock

There were 24 cows on the farm when Gary's father bought it. He has gradually increased to about 40 milkers and 20 heifers. Gary owns 3 of the cows and 4 heifers.

Financial Situation

There is a $5,200 balance on the $20,000 farm mortgage which was obtained in 1958 to pay off the balance of the contract and buy the second farm. Mr. Lane always aims to keep a good balance in his checking account so that he can pay cash for current purchases.

Farm Business Records

In 1950, the Lanes joined a three-year Extension farm account club. They have kept the Cornell Farm Account and Farm Inventory Books ever since. Gary used the records in his Vo-Ag work. In view of Gary's plans to farm, the family enrolled in the Extension Farm Business Management Project in 1966. Their business summary is on the next page.

1966 FARM BUSINESS SUMMARY

Farm located in Central New York State. Honeoye-Lima soils. Total acres in farm 189, cropland 150 acres, woods 20 acres, and permanent pasture 8 acres, farmstead, etc. 11 acres.

CAPITAL INVESTMENT

	1/1/66	1/1/67
Machinery & equipment	$10,030	$10,995
Livestock	14,500	14,575
Feed & supplies	3,996	4,536
Land & buildings	35,000	35,000
TOTAL INVESTMENT	$63,526	$65,106

EXPENSES

Dairy concentrate	$ 4,763
Labor, unpaid (5 mo.)	1,000
Gas and oil	683
Machinery repairs	707
Bale ties	166
Milk hauling	737
Machine hire	606
Auto expense (farm share)	235
Electricity (farm share)	335
Breeding fees	268
Veterinary, medicine	518
Other livestock expense	473
Fertilizer and lime	1,392
Seeds and plants	392
Spray and other	256
Land, building, fence repair	698
Taxes	731
Insurance	385
Telephone	89
Miscellaneous	220
New machinery	2,805
Purchased livestock	600
TOTAL FARM EXPENSES	$18,059

CROPS GROWN

Crop	Acres	Yield	Total Crop
Hay	84	2.7	227 tons
Corn silage	13	17	221 tons
Grain corn	9	83	747 bu.
Oats	22	58	1,278 bu.
Wheat	22	38	836 bu.
Total	150		

RECEIPTS

Milk sales	$23,349
Livestock sold	2,418
Crop sales	1,277
Government payments	346
Gas tax refund	140
Cash rent (house)	540
Miscellaneous	151
Total Cash Receipts	$28,221
Increase in Inventory	1,580
TOTAL FARM RECEIPTS	$29,801

FINANCIAL SUMMARY

Total Farm Receipts	$29,801
Total Farm Expenses	18,059
Farm Income	$11,742
Interest at 5%	3,216
LABOR INCOME	$ 8,526

BUSINESS FACTORS

Man equivalent	1.4
Number of cows	39
Number of heifers	20
Lbs. of milk sold	483,700
Average test of milk	3.7%

ANALYZING THE FARM BUSINESS

1. A Farm Business Chart has been inserted in this booklet. Using the data provided on page 4, fill out both sides of the chart.

2. Some farm business factors are listed below for a group of 673 New York dairy farms in 1965. An average for all the farms is given in the first column and an average for the 10 percent of the farms with the highest labor incomes is presented in the second column. The third column is designed to help you analyze the Lane farm business. Some of the items have been calculated and are filled in. You are to figure the other factors. Then study this farm business.

   (The 673 dairy farms in the Farm Business Management Projects are considerably better than the average for all farms in the State.)

Comparisons of Farm Business Factors

Business Factor	673 N. Y. Dairy Farms, 1965 Average of all 673 farms	 Average of top 10% by labor income	Lane Farm 1966
Capital Investment (end of year)			
Capital per cow	$1,565	$1,649	$ 1,669
Machinery investment per cow	$335	$319	$ 282
Machinery Costs			
Net machinery cost*	$5,104	$7,660	$ 5,695
Net machinery cost per cow	$116	$108	$ 146
Rates of Production and Feed Costs			
Lbs. milk sold per cow	11,900	12,900	
Percent feed bought is of milk receipts	29%	28%	%
Feed bought per cow**	$154	$162	$ 122
Heifers per 10 cows	6.1	6.1	5.1
Average Price per cwt. Milk Sold	$4.41	$4.54	$ 4.83

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* Includes depreciation, repairs, gas and oil, interest, milk hauling, custom machine hire, farm share of auto, bale ties, and farm share of electricity, less gas tax refund and income from machine work.

** Includes feed for replacement heifers.

EVALUATION

The Farm Business

After studying a farm business, it often helps to clarify one's thinking by examining the strong and weak points. Place a check mark under weak, satisfactory, or very good as you see the strengths and weaknesses in the Lane business.

	Weak	Satisfactory	Very Good
Crop yields	______	______	______
Animal production	______	______	______
Size of business	______	______	______
Labor efficiency	______	______	______
Capital investment	______	______	______
Machinery costs	______	______	______
Feed costs	______	______	______

The Manager

The "manager" is an important part of any business. In evaluating a farm situation, it is important to include an analysis of the "manager" of the business. Place a check mark under yes or no for the questions below.

	Yes	No
Is the manager clear on his goal?	______	______
Has he had experience with hired help?	______	______
Does he like to take risks?	______	______
Is his debt situation sound?	______	______
Has he made reasonable progress?	______	______

THE SITUATION AND PROBLEM

The Lanes are looking ahead to when Gary finishes college next year. They have decided to form a partnership and realize that it takes time to develop plans and get changes into operation.

Recently, the local milk cooperative where the Lanes sell their milk, has been discussing the possibility of going to all bulk. A suggested target date for this change is July 1968.

Gary and his father have been discussing their present situation, their goals, and possible things which they might do. Their general objective is to develop a business that will provide a reasonable living for two families. At present, they have four alternatives under serious consideration. They have assembled information and prepared budgets (pages 8-13). The problem is to decide which is the best alternative for the future.

Alternative 1 - Concentrate on getting the debts paid off. Look for a milk plant that will continue to take can milk. Continue the present herd management practices. Clean up the sugar equipment which has been stored since 1958 and bring sugar bush (400 trees) back into production.

Alternative 2 - Convert heifer pens to stanchions and increase herd to 50 cows; enlarge milk house for bulk tank, purchase a dumping station; move heifers to barn across the road.

Alternative 3 - Construct a new 150-cow free-stall system with double-six herringbone parlor on knoll across the road. Use old barn on home farm for young cattle. Erect two 30 x 60 concrete silos with automated handling and go to a high corn silage feeding program. Cash rent neighboring farm with 80 acres of cropland (rents now for $1,500).

Alternative 4 - Convert present barn to a 75-cow free-stall system (build on with pole construction), erect a new 20 x 60 silo, install a double-three herringbone milking parlor, and increase the level of silage feeding.

SUPPLEMENTAL INFORMATION AND ANALYSIS OF ALTERNATIVES

Alternative 1 - Tap Maple Trees - Get Out of Debt

Mr. Lane operated the sugar bush until 1958. He hung two buckets per tree and averaged about 0.25 gallons of syrup per bucket. The equipment that has been stored is adequate and will require only cleaning and annual maintenance. They cut their own fuel. Containers, repairs and other miscellaneous expenses would be about $100 per year. Syrup has averaged about $4 per gallon for the last few years.

Milk hauling to the new plant will be 25¢ instead of the present 15¢.

Projected Farm Business Summary

CAPITAL INVESTMENT

Machinery & equipment	$10,995
Livestock	14,575
Feed & supplies	4,536
Land & buildings	35,000
TOTAL INVESTMENT	$65,106

EXPENSES

Dairy concentrate	$ 4,763
Labor	0
Gas & oil	683
Machinery repairs	707
Bale ties	170
Milk hauling	1,210
Machine hire	606
Machinery depreciation	1,900
Auto expense (farm share)	275
Electricity (farm share)	335
Breeding fees	268
Veterinary, medicine	518
Other livestock expense	473
Fertilizer & lime	1,392
Seeds & plants	392
Spray & other	256
Syrup supplies	100
Land, building, fence repair	698
Taxes	731
Insurance	385
Telephone	89
Miscellaneous	220
TOTAL FARM EXPENSES	$16,171

CROPS GROWN

Crop	Acres	Yield	Total Crop
Hay	84	3	252 tons
Corn silage	13	15	195 tons
Corn grain	9	80	720 bu.
Oats	22	60	1,320 bu.
Wheat	22	40	880 bu.
Total	150		

RECEIPTS

Milk sales @ $4.50 per cwt.	$21,767
Livestock sold	2,418
Crop sales	1,277
Maple syrup	800
Miscellaneous	635
TOTAL FARM RECEIPTS	$26,897

FINANCIAL SUMMARY

Total farm receipts	$26,897
Total farm expenses	16,171
Farm Income	$10,726
Interest at 5%	3,216
LABOR INCOME/farm	$ 7,510
LABOR INCOME/operator	$ 3,755

BUSINESS FACTORS

Man equivalent	2.0
Number of cows	39
Number of heifers	20
Gallons syrup sold	200
Lbs. milk sold	483,700
Price received for milk	$4.50

Alternative 2 - Increase Herd to 50 Cows

An ell on the present barn is now used for calves and heifers. Some pens could be removed and ten stanchions put in. There would still be room for the small calves. The larger heifers would be moved to the barn across the road. A short shuttle-stroke gutter cleaner, which would push the manure from these ten cows into the existing cleaner, would be installed. The Lanes would enlarge the milk house and buy a bulk tank and a dumping station.

The total cost of making this change is estimated to be $9,875. This cost includes: remodeling the stable, enlarging the milk house, a 700-gallon bulk tank, dumping station, 10 cows and 3 yearlings (to provide replacement for the 10 cows).

Projected Farm Business Summary

CAPITAL INVESTMENT

Machinery & equipment	$12,000
Livestock	18,600
Feed & supplies	5,500
Land & buildings	35,800
TOTAL INVESTMENT	$71,900

EXPENSES

Dairy concentrate	$ 6,783
Labor	0
Gas & oil	800
Machinery repairs	900
Bale ties	250
Milk hauling	0
Machine hire	225
Machinery depreciation	2,200
Auto expense (farm share)	325
Electricity (farm share)	475
Breeding fees	340
Veterinary, medicine	650
Other livestock expense	800
Fertilizer & lime	1,500
Seeds & plants	400
Spray & other	260
Land, building, fence repair	800
Taxes	760
Insurance	455
Telephone	110
Miscellaneous	350
TOTAL FARM EXPENSES	$18,383

CROPS GROWN

Crop	Acres	Yield	Total Crop
Hay	110	3	330 tons
Corn silage	13	15	195 tons
Oats	20	60	1,200 bu.
Corn grain	7	75	525 bu.
Total	150		

RECEIPTS

Milk sales	$27,900
Livestock sold	2,900
Crop sales	0
Miscellaneous	700
TOTAL FARM RECEIPTS	$31,500

FINANCIAL SUMMARY

Total Farm Receipts	$31,500
Total Farm Expenses	18,383
Farm Income	$13,117
Interest at 5%	3,595
LABOR INCOME/farm	$ 9,522
LABOR INCOME/operator	$ 4,761

BUSINESS FACTORS

Man equivalent	2.0
Number of cows	50
Number of heifers	25
Lbs. milk sold per cow	12,400
Lbs. milk sold	620,000
Price received for milk	$4.50

Alternative 3 - Financing the Change

Financing is an important consideration when planning a major change in a business. Below are forms which can be used in considering the financing. The calculations have been made for the Lane's financing of Alternative 3.

How Much Will They Need to Borrow?

Total estimated additional investment	$128,725
Amount of debt now outstanding	5,200
Total Amount Needed	$133,925

How Much Can They Borrow?

Commercial lenders have guides that are used in making loans. Below are the calculations for this proposed operation.

		Maximum Loan
Value Real Estate	$65,000 x 2/3 =	$43,300
Value Livestock & Equipment	$79,400 x 1/2 =	39,700
Probable Total Maximum Loan		$83,000

Can They Make the Payments?

The amount available for debt repayment can be calculated from the projected farm business summary figures. The debt payments required on the amount needed also can be figured. The calculations for Alternative 3 are below.

Amount Available for Debt Repayment

Total Cash Receipts	$88,700
Total Cash Expenses	57,585
Cash Operating Income	$31,115
Less: Estimated Cash Living Cost	9,000
Annual Maximum Available for Debt Payment	$22,115

Payments Required (6% interest rate)

Kind of Debt	Thousand Dollars of Debt	Factor	Monthly Payment
20 Yr. Real Estate Mortgage	43	$ 7.20	$ 310
5 Yr. Chattel Lien	40	$19.50	780
Other debt (5 yr.)	51	$19.50	995
Total Monthly Payments			$2,085

Total monthly payments $2,085 x 12 = $25,020 annual payments required

Alternative 3 - New 150-Cow Free-Stall System

Gary and his father think free-stall systems look promising. They could construct a new 150-cow unit across the road and use the existing barns for heifers. A complete silage roughage program would be adopted for the cows. Heifers would be fed hay and silage.

The neighboring farm which can be cash rented has Honeoye-Lima soil which is in a good state of fertility. By growing only roughage crops and fertilizing well, the Lanes believe they can grow the silage needed for 150 cows and the young stock. They would buy some hay. The present line of machinery would be adequate.

The estimated additional investment for this plan is $128,725. This includes $67,200 for buildings and silos, $13,400 for equipment and $48,125 for cattle.

Projected Farm Business Summary

CAPITAL INVESTMENT

Machinery & equipment	$ 16,700
Livestock	62,700
Feed & supplies	15,000
Land & buildings	65,000
TOTAL INVESTMENT	$159,400

EXPENSES

Dairy concentrate	$25,800
Hay (90 tons)	2,700
Hired labor (1 man & house rent)	6,000
Gas & oil	1,400
Machinery repairs	1,800
Bale ties	75
Milk hauling	0
Machine hire	0
Machinery depreciation	3,300
Auto expense (farm share)	400
Electricity (farm share)	1,400
Breeding fees	1,035
Veterinary, medicine	1,950
Other livestock expense	2,200
Fertilizer & lime	2,900
Seeds & plants	675
Spray & other	950
Land, building, fence repair	1,400
Taxes	1,525
Insurance	1,275
Rent of farm	1,600
Telephone	200
Miscellaneous	900
TOTAL FARM EXPENSES	$57,585

CROPS GROWN

Crop	Acres	Yield	Total Crop
Hay crop silage	70	9.0	630 tons
Corn silage	140	15	2,100 tons
Oat silage	20	7.5	150 tons
Total	230		

RECEIPTS

Milk sales	$81,000
Livestock sold	6,500
Crop sales	0
Miscellaneous	1,200
TOTAL FARM RECEIPTS	$88,700

FINANCIAL SUMMARY

Total Farm Receipts	$88,700
Total Farm Expenses	57,585
Farm Income	$31,115
Interest at 5%	7,970
LABOR INCOME/farm	$23,145
LABOR INCOME/operator	$11,572

BUSINESS FACTORS

Man equivalent	3.0
Number of cows	150
Number of heifers	75
Lbs. milk sold per cow	12,000
Lbs. milk sold	1,800,000
Price received for milk	$4.50

Alternative 4 - Convert Barn to 75-Cow Free-Stall System

The fourth alternative being considered is to increase the herd to 75 cows by converting the existing barn to free stalls and adding a bunk-free stall addition. This addition would be made to the end of the barn so that it could be conveniently added to later. A double-three herringbone parlor would be constructed. Adding a 20 x 60 silo would allow them to feed hay crop and oat silage during the summer and corn silage and hay during the winter. The barn across the road would house all the heifers. The ell on the present barn would be used as an isolation and maternity area and for calves.

The estimated investment required to make this change is $49,225. This includes $27,700 for buildings and silo, $6,300 for equipment and $15,225 for cattle.

Projected Farm Business Summary

CAPITAL INVESTMENT

Machinery & equipment	$ 13,200
Livestock	29,800
Feed & supplies	8,000
Land & buildings	50,000
TOTAL INVESTMENT	$101,000

EXPENSES

Dairy concentrate	$12,900
Hired labor	0
Gas & oil	825
Machinery repairs	900
Bale ties	150
Milk hauling	0
Machine hire	0
Machinery depreciation	2,500
Auto expense (farm share)	300
Electricity (farm share)	700
Breeding fees	515
Veterinary, medicine	975
Other livestock expense	1,000
Fertilizer & lime	1,600
Seeds & plants	400
Spray & other	400
Land, building, fence repair	1,050
Taxes	1,075
Insurance	770
Telephone	150
Miscellaneous	600
TOTAL FARM EXPENSES	$26,810

CROPS GROWN

Crop	Acres	Yield	Total Crop
Hay	50	3.0	150 tons
Hay crop silage	30	9.0	270 tons
Corn silage	50	15	750 tons
Oats	20	7.5	150 tons
Total	150		

RECEIPTS

Milk sales	$40,500
Livestock sold	4,400
Crop sales	0
Miscellaneous	800
TOTAL FARM RECEIPTS	$45,700

FINANCIAL SUMMARY

Total Farm Receipts	$45,700
Total Farm Expenses	26,810
Farm Income	$18,890
Interest at 5%	5,050
LABOR INCOME/farm	$13,840
LABOR INCOME/operator	$ 6,920

BUSINESS FACTORS

Man equivalent	2.0
Number of cows	75
Number of heifers	38
Acres of crops	150
Lbs. milk sold per cow	12,000
Lbs. milk sold	900,000
Price received for milk	$4.50

Alternative 4 - Financing the Change

How Much Will They Need to Borrow?

Total estimated additional investment	$49,225
Amount of debt now outstanding	5,200
Total Amount Needed	$54,425

How Much Can They Borrow?

		Maximum Loan
Value Real Estate	$50,000 x 2/3 =	$33,300
Value Livestock & Equipment	$43,000 x 1/2 =	21,500
Probable Total Maximum Loan		$54,800

Can They Make the Payments?

Amount Available for Debt Repayment

Total Cash Receipts	$45,700
Total Cash Expenses	26,810
Cash Operating Income	$18,890
Less: Estimated Cash Living Cost	9,000
Annual Maximum Available for Debt Payment	$ 9,890

Payments required (6% interest rate)

Kind of Debt	Thousand Dollars of Debt	Factor	Monthly Payment
20 Yr. Real Estate Mortgage	33	$ 7.20	$238
5 Yr. Chattel Lien	21	$19.50	410
Other debt (5 yr.)	0	$19.50	0
Total Monthly Payments			$648

Total monthly payments $648 x 12 = $7,776 annual payments required

WORK UNITS FOR LIVESTOCK AND CROPS

LIVESTOCK	Number or acres on this farm		Work units per head or per acre		Total work units
Dairy Cows		×	7.5	=	
Beef Cows		×	2	=	
Heifers		×	2	=	
Hens (production only)		×	0.04	=	
Egg processing (per doz.)		×	0.002	=	
Pullets raised		×	0.004	=	
Broilers raised		×	0.003	=	
Brood sows		×	3	=	
Hogs raised		×	0.15	=	
Ewes		×	0.5	=	
		×		=	

MAN EQUIVALENT

Workers	Full-Time Months
Operator(s)	
Family (paid)	
Family (unpaid)	
Hired men	
Other	
Total	
Man equivalent (Total ÷ 12)	

CROPS						Yield per acre	Total Crop	
Hay		×	0.6	=				tons
		×		=				tons
Corn Silage		×	0.8	=				tons
Corn for grain		×	0.6	=				bu.
Oats		×	0.6	=				bu.
Wheat		×	0.6	=				bu.
		×		=				
		×		=				
Dry beans		×	1.5	=				lbs.
Potatoes		×	6	=				cwt.
Cabbage		×	9	=				tons
Snap beans for processing		×	1	=				tons
Onions		×	12	=				cwt.
		×		=				
		×		=				
		×		=				
		×		=				
Apples–growing		×	4	=				bu.
Apples–harvest–per bushel		×	0.02	=				

OTHER					
Work off farm, days		×	1	=	
Marketing		×		=	
		×		=	
TOTAL WORK UNITS					

WORK UNITS PER MAN

(Total work units ÷ man equivalent)

Total pounds of milk sold ______ ÷ no. of cows ______ = ______ pounds of milk sold per cow

Total pounds of milk sold ______ ÷ man equivalent ______ = ______ pounds of milk sold per man

Number of cows ______ ÷ man equivalent ______ = ______ cows per man

Total dozens of eggs sold ______ ÷ no. of hens ______ = ______ dozens of eggs sold per hen

Dozens of eggs per hen × 12 = ______ eggs sold per hen

Number of hens ______ ÷ man equivalent ______ = ______ hens per man

Total dozens of eggs sold ______ ÷ man equivalent ______ = ______ doz. of eggs sold per man

Total lbs. of feed for laying flock ______ ÷ doz. of eggs sold ______ = ______ lbs. of feed per doz. eggs

Module: Reorganizing A Farm Business - 01010406-02

Resource materials for teachers.

Books :

1. Profitable Farm Management Hamilton and Bryant Sec. Ed. 1963
2. Profit Maximizing Principles OSU 1970 (Cornell IMS)

Booklets:

1. Planning A Profitable Farm Business Cornell IMS
2. Agricultural Business Management *- Pinciples That Effect Production

   Cornelll IMS

Movies :

I.
1. Farm Management Film Series Cornell Film Library 3 films 45 min. eac
2. Agricultural Resources in New York State Cornell Film Library 35 min.

Other resources :

1. Class visit to a farm business .
2. Class visit by a banker
3. Farm business problems made up by teacher.

Note: The Cornell Farm Business Chart and a Farm Business Problem are included in this module as a part of the unit, however a teacher may set up his own farm business problem.

MODULE OF INSTRUCTION

Title - FARM BUSINESS INSURANCE Code - 01.010406-03

DESCRIPTION:

Students studying the Farm Business Insurance module will be involved in the selection and use of various types of insurance considered necessary for the safe financial operation of a farm business.

Liability, property and motor vehicle insurance will be considered by students in relation to the level of risk and size of business for a given farm situation.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Making decisions about insurance	1	1½
2. Insurance terms, types of insurance coverage and types of insurance companies	3½	2
3. Selecting types and amounts of insurance for the entire farm business.	3	5
4. Selecting an agency	1	1½
5. How to purchase insurance	1½	4
6. Making claims	1½	4½
	11½	18½

Revised June, 1974

MODULE OF INSTRUCTION

Title - FARM BUSINESS INSURANCE

Code - 01.010406-03

OBJECTIVES to be obtained:

The student will be able to:

1. Using references, correctly describe the chances of loss, causes of loss and the effect of loss that may occur in a farm business.
2. Score 80% on a test pertaining to insurance terms and types of insurance.
3. Name three different kinds of insurance companies and list three advantages and three limitations of each.
4. Make a priority list which, to the satisfaction of the teacher, will indicate the insurance needs of a prearranged business.
5. Select the kinds and amounts of insurance for that prearranged business and calculate the cost of such coverage within a specific sum provided for by the teacher.
6. List six factors to consider in selecting an agency from which to purchase insurance.
7. Demonstrate, in a role play situation, how to purchase and maintain an insurance program for a given farm business.
8. Fill out a claim form for a given situation to the satisfaction of the instructor.

Code - 01.010406-03

Title - FARM BUSINESS INSURANCE

OBJECTIVES BY UNIT	CONTENT
Unit 1 Making decisions about insurance Objective 1. Using references, correctly describe the chances of loss, causes of loss and the effect of loss that may occur in a farm business.	A. Define term insurance B. Chances of losses C. Causes of losses D. Effects of losses
Unit 2 Insurance terms, types of insurance coverage and types of insurance companies Objective 2. Score 80% on a test pertaining to insurance terms and types of insurance	A. Terms . policy . premium . priorities . endorsement . blanket coverage . face value . indirect losses . deductible clauses B. Types of insurance . Property insurance Fire (define) . purpose . calculating cost . deduction Wind (define) . as an endorsement . cost . Motor Vehicle insurance . Personal injury liability (define) . minimum (state law)-maximums and cost differences . one person . all persons . cost . age of operator . area of residence . class . distance of work . accident experience of principle drivers . Property damage .. minimum (state law)-maximums and cost differences . cost . Medical Payment (define) . range of amounts and cost of each

01.010406-03 - Code

FARM BUSINESS INSURANCE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and class discussion B. Assign reading on term insurance	A. Students join in discussion on decision making about insurance B. Students review their own insurance programs C. Students discuss parents or cooperative farmers insurance programs	A. Students write a composition on the assigned reading. Grade and return for notebooks. B. Participation in discussion. C. Extra credit for student. Written report on his personal or farms insurance program.
A. Show slide film on insurance B. Prepare a handout with definitions of terms C. Lecture and students discussion of terms D. Invite insurance people in as resource people. . Liability . car . property . Fire . Life . Medical . Disability	A. Students observe film and record notes B. Students keep handout in notebook C. Groups of students prepare reports on the types of insurance listed in content. Each student in the group can report on a specific topic under one type of insurance. D. Students take notes on all reports of resource people invited to class.	A. Written test. 80% accuracy . Sample questions .define 5 of the following terms: . policy . premium . face value . endorsement . deductible clause . indirect loss . In the spaces provided place the word which best completes the following: . the type of insurance which provides protection against financial loss in case your car hits the neighbor's barn is ________.

OBJECTIVES BY UNIT	CONTENT
	. Comprehensive (define) . cost . Uninsured motorist clause (define) . cost . Fire and Theft (define) . cost . Collision (define) . need . cost . deductible clause . Public Liability . farmers public liability-general (define) . coverage . cost . farmers public liability-comprehensive (define) . coverage . cost . farm employers liability (define) . coverage . cost . workmens compensation (define) . coverage . cost B. Notebook grades
Objective 3 Name 3 different kinds of insurance companies and list 3 advantages and 3 limitations of each.	A. Stock B. Mutual C. Cooperative

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher give definition of each and ask students what they think would be advantages or disadvantages. Make a consensus list. B. List the various kinds of insurance companies in your area. Identify each company according to the kinds of insurance they specialize in and if they are a stock, mutual or cooperative insurance company.	A. Students take notes, discuss advantages and disadvantages of the insurance companies in the area.	A. Students orally answer questions to review material discussed. B. Written test-list companies with advantages, limitations and type of insurance they write.

Code - 01.010406-03

Title - FARM BUSINESS INSURANCE

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Selecting types and amounts of insurance for the entire farm business. Objective 4 Make a priority list which, to the satisfaction of the teacher, will indicate the insurance needs of a prearranged business.	A. List kinds of insurance needed . Most important . Important . Less important B. Decision based on . Amount invested . Likelihood of loss . Cost of cover[illegible] . Etc
Objective 5 Select the kinds and amounts of insurance for that prearranged business and calculate the cost of such coverage within a specific sum provided for by the teacher.	A. Property B. Auto and truck (motor vehicle) C. Public liability
Unit 4 - Selecting an agency Objective 6 List six factors to consider in selecting an agency from which to purchase insurance.	A. Factors to consider when selecting an insurance agency . Location . Services offered . Reliability . Compatability of purchaser and agent . Promptness . Insurance cost . Willingness of the agent to re-evaluate coverage regularly

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and class discussion on how to determine priorities B. Use insurance resource people to discuss selecting types and determining amounts of insurance to carry for a farm business.	A. Participate in discussion - suggest reasons why one type may be more important for a given situation. B. Students make list of priorities for their own situations and list reasons for the selection.	A. Evaluate individuals' lists and reasoning behind choices. B. Written test on given situations regarding a sample farm business.
A. Have a local agent discuss farm insurance with students. B. Teacher provides prearranged farm business information. C. Field trip to farm to gather data for performance test.	A. Take part in discussion B. Teacher-student discussion of insurance needs for this farm business. Agent and students discuss total insurance needs for farm. C. Do performance test based on data from actual farm business.	Performance Test. A. Students list priorities for the farm. B. Recommend types of insurance. C. Recommend actual amounts of insurance to apply to each type of insurance selected, and calculate cost of such coverage.
A. Lecture and class discussion. B. Ask students what they feel are important attributes of an agency they would like to deal with. C. Make a list of factors.	A. Students list factors and the importance of each in notebooks.	A. Grade the student participation in discussion. B. Paper and pencil quiz - list 6 factors. C. Give characteristics of two hypothetical agencies and have students select one and tell the factors that led to their decision.

OBJECTIVES BY UNIT	CONTENT
Unit 5 - How to purchase insurance Objective 7 Demonstrate in a role play situation how to purchase and maintain an insurance program for a given farm business.	A. Records needed . Cash account . Inventory . Depreciation chart B. Making an appointment . At convenience of insuree . At home of insured C. Points to discuss D. Periodic re-evaluation
Unit 6 - Making Claims Objective 8 Fill out a claim form for a given situation to the satisfaction of the instructor.	A. Contacting the agent or adjustor B. Listing all losses with values C. Understand partial loss vs complete loss D. Guard against being taken in by claims agents-also wise use of claims agents where it might prove beneficial

EDUCATION

01.010406-03- Code

FARM BUSINESS INSURANCE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A.Guest agent and teacher role playing B.Discuss material listed in content C.Visit a local insurance company office. Have the manager describe his business and service rendered to customer.	A.Role playing Students act as agents and insuree. Different students act out each of the 4 areas listed under content.	A.Grade performance of each student who plays the role of insuree. B.Field trip. Report grade.
A. Discuss making claims with the class B. Provide claim forms C. Give hypothetical damage information on the farm studied. Students complete claim forms based on that data.	A. Student contacts an agent and gets information about making a claim. B. Student fills out claim form for a given situation in relation to the business studied in this unit.	A. Grade the student summary on his interview with the agent. B. Grade the completed claim form for the farm business situation.

MODULE OF INSTRUCTION

Title - FARM BUSINESS INSURANCE Code - 01.010406-03

RESOURCE MATERIALS

A. Books -

1. Teacher references

Farm Management Handbook

2. Student references

Doane's Farm Management Guide 9th Edition

B. Bulletins -

1. Teacher references

Insurance for the Farm Business, R.S. Smith - Cornell Extension Bulletin	# 1003
Insurance facts for farmers - U.S.D.A. Farmers Bulletin	# 2137
Insurance in agriculture - Robert E. Norton Instructional Materials Service	# G10

2. Student references

Insurance in the Farm Business - R.S. Smith and J. R. Tabb
Cornell Extension Bulletin #1003

3. Life Insurance for Farm Families. Bulletin 1002, Ithaca, New York College of Agriculture, Cornell University, 1967.

C. Audiovisuals -

1. Teachers own premium statements for a 2 year period to show reduction of premium with age of car. (transparencies)
2. Filmstrip - Insurance for the Farm Business Instructional Materials Service # F2.1
3. Film on insurance, Insurance In the Farm Business, Slide film 380A, Vocational Agriculture Service, University of Illinois, Urbana, Ill.1973

MODULE OF INSTRUCTION

Title - FARM BUSINESS LAW

Code - 01.010406-04

DESCRIPTION:

The person engaged in any agricultural enterprise is constantly involved in application of the law. From this module the student should gain a genuine respect and intelligent appreciation for a segment of the law that affects him at home and at work. The student will develop an understanding of the law, particularly as it effects farming enterprises. He will learn to use the law to avoid legal pitfalls.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. The Nature of Law; Violations of Laws	9	8
2. Contracts and Agreements	3	2
3. Transfer of Ownership	2	1
4. Partnerships and Corporations	2	3
	16	14

Revised June 1974

MODULE OF INSTRUCTION

Title - FARM BUSINESS LAW Code - 01.010406-04

Objectives to be obtained:

The student will be able to:

1. Define the term law and list the three essentials each law must provide, after lecture and discussion of needs of laws.
2. List from memory the two major sources of laws.
3. With the aid of the instructor, list the three types of courts in the U.S. Court System and list the three duties of these courts.
4. With the aid of his instructor compile a list of at least 8 legal documents (books and pamphlets) which should be available for use in the farm business.
5. With the use of available references, define the four types of violation of law and the three major classification of crimes.
6. Differentiate to the instructor satisfaction between oral and written contracts and express and implied contracts.
7. Complete a prepared contract blank to purchase an agricultural service.
8. List from memory four of the five reasons for legal termination of contracts.
9. List from memory at least three ways of transferring property and five reasons for preparing a will.
10. List, using references, five important characteristics of a partnership.
11. List from memory three advantages and three disadvantages of partnerships.
12. List three advantages and three disadvantages of a corporation, and differentiate between a partnership and a corporation.

OBJECTIVES BY UNIT	CONTENT
Unit 1 - The Nature of Law; Violations of Laws. Objective 1 Define the term LAW and list the three essentials each law must provide, after lecture, and discussion of the needs of laws.	A. Define: Law B. Essentials of laws . Defines rights of people . Protects people in enjoyment of rights . Provides punishments for people jeopardizing those rights C. Moral obligations D. Legal obligations
Objective 2 List from memory two major sources of law.	A. Common law B. Statutory law
Objective 3 With the aid of the instructor, list three types of courts in the U.S. Court System, and list the three duties of these courts.	A. U.S. Courts B. State law courts C. State equity courts

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Supervised study	A. Take notes on information presented.	A. Written or oral test. B. Evaluate student's ability to . Define law . List the three essentials of all laws.
A. Reading and supervised study. B. Reflective thought, student oriented discussion (2 panels each selected by members of one-half the class).	A. Research - one group, the needs for and uses of common law. Another group, the needs and uses of statutory laws. B. Students can discuss actual cases that dealt with common and statutory laws in the community.	A. Observe student progress and results of panel discussion. B. Essay questions on common law and statutory law.
A. Reading and supervised work experience. B. Class discussion . Essentials of Business Law . Bulletin 988 C. Invite a good local attorney to discuss common law, statutory law and our court systems.	A. Note taking B. Students could report on the local, town and county courts in their area. Note the location of the higher courts in the state.	A. Written or oral test. B. Student will name and identify to the instructor's satisfaction at least three uses of two of the three types of courts in the U.S. system.

Code - 01.010406-04

Title - FARM BUSINESS LAW

OBJECTIVES BY UNIT	CONTENT
Objective 4 With the aid of his instructor, compile a list of at least 8 legal books and pamphlets, which should be available for use in the farm business.	A. Legal books and pamphlets . Buying a farm on contract . Taxmanship in farm management decision making . Legal terms and obligations common to farm business . Incorporating of the farm business . Father and son partnership arrangements . Father and son arrangements on the farm . The farmer and the lawyer . Essentials of business law . Profitable farm management . Others available
Objective 5 With the use of available references, define the four types of violation of law and the three major classifications of crimes.	A. Violations . Assault and battery . Trespass . Negligence . Deceit . Slander . Libel B. Kinds of crimes . Treason . Felonies . Misdemeanors
Unit 2 - Contracts and Agreements. Objective 6 Differentiate, to the instructor's satisfaction, between oral and written contracts, and express and implied contracts.	A. Contracts - define . Oral . Written . real estate . non-real estate B. Express C. Implied

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study. Assign questions from all references. B. Field trip to a local court session audience with judge.	A. Student lists titles, authors, and publishers of the best available references. B. Take notes on proceedings concerning information studies. C. List questions which arise.	A. Evaluate completion and neatness of supervised study exercise. B. Notebook grade. C. Field trip report.
A. Supervised study B. Class discussion	A. Each student is assigned to prepare at least one particular violation or kind of crime and outline it in detail in a report. B. Students will develop a module packet on this module and use it for future reference.	A. Written or oral test. B. List at least five of the six types of violation of law, and define one of the three kinds of crime to the instructor's satisfaction.
A. Lecture B. Supervised study - buying a farm on contract. C. Visiting lecturer (lawyer familiar with agricultural experiences).	A. Note taking. B. Complete worksheet made up by the instructor. C. Questions related to problems studied. D. Students will use contracts in FFA projects such as crop demonstrations, calf chains and pig chains.	A. Written test on objectives. B. Grade worksheet for accuracy. C. Notebook grade.

Code - 01.010406-04

Title - FARM BUSINESS LAW

OBJECTIVES BY UNIT	CONTENT
Objective 7 Complete a prepared contract blank to purchase an agricultural service.	A. Reading of the contract B. Formality and simplicity of terms C. Competency . Legal age in state D. Liability E. Signatures and seals
Objective 8 List from memory 4 or 5 reasons for legal termination of contracts.	A. Legal termination of a contract . Fraud . Misrepresentation . Puffing . Duress . Undue influence
Unit 3 - Transfer of Ownership. Objective 9 List from memory at least three ways of transferring property and five reasons for preparing a Will.	A. Transferring property . Purchase . Gift . Will . Occupancy . Finding B. Preparing a Will . Legal . Time . Cost of representation . Loss of evaluation to state . Stress

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Objective 7 A. Lecture and class discussion. B. Supervised practice in completion of blank contracts.	A. Note taking. B. Completion of contract for any agricultural service, sanctioned by the instructor.	A. Evaluate completed contract blank.
A. Lecture B. Supervised study.	A. Note taking. B. Students will be arranged into five groups. Each group will research and prepare a discussion for one of the legalities terminating a contract.	A. Test oral or written. B. The student will name four of the five ways of terminating a contract. C. Notebook grade.
A. Supervised study. B. Lecture. C. Class discussion.	A. Read, take notes. B. Open discussion on transfer of property. C. Students will use this information on Work Experience Records for class requirements and FFA award programs.	A. Test, written or oral. B. Name three ways of transferring property and five reasons for preparing a Will.

Code - 01.010406-04

Title - FARM BUSINESS LAW

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Partnership and Corporation. Objective 10 List, using references, five important characteristics of a partnership.	A. Characteristics . Created by contract . Each partner is an agent for the other . Organized to make a profit . Each must have an interest in the business . Good faith and liability of each partner
Objective 11 List, from memory, three advantages and three disadvantages of partnerships.	A. Partnerships . Advantages . . contribution of knowledge, ability, skill, and experience by two . . reduced expenses . . efficiency through cooperation . . combined resources for credit . Disadvantages . . each personally liable for all debts . . disagreement . . each is liable for all business acts or violations of other B. Types of partnership arrangements C. Profit sharing D. Settling arguments
Objective 12 List, from memory, three advantages and three disadvantages of a corporation and differentiate between a partnership and a corporation.	A. Corporation - define. . Advantages . . stockholder may not be held liable for debts of firm . . large sums of money acquired through sale of stock . . life of a corporation not affected by change in ownership . . ownership easily transferred . . control nested in directors and officers . Disadvantages . . lacks personalization . . special taxes do not apply . . may only engage in enterprises provided in its charter . . subject to many state regulations B. Partnerships . Advantages . Disadvantages

EDUCATION

01.010406-04 - Code

FARM BUSINESS LAW - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture. B. Field trip to a farm organized as a partnership. C. Use adult farmer partnerships as example.	A. Note taking. B. Questions to the partners. C. Assist students to develop partnerships with their parents or with cooperative farmers.	A. Evaluation of notes. B. Written test.
A. Lecture. B. Class discussion. C. Assigned questions from reference materials. D. Invite a resource person involved in a partnership to discuss the partnership with students.	A. Note taking. B. Students will complete jobs as assigned by the instructor. C. Notebooks will be kept for module completion and course requirements.	A. Written or oral test. Three advantages and three disadvantages of partnerships. B. Notebook grade.
A. Supervised study. B. Class oriented discussion . Essentials of Business Law C. Field trip to agricultural corporation and partnership.	A. Students use references to discover advantages and disadvantages of corporations. B. Class discussion. C. Written report of comparison of corporations and partnerships.	A. Written or oral test . Three advantages and three disadvantages of a corporation. . Choose which is better in your opinion and defend it with at least three reasons, the partnership or the corporation.

MODULE OF INSTRUCTION

Title - FARM BUSINESS LAW Code - 01.010406-04

RESOURCE MATERIALS

Books

1. Hamilton and Bryant. Profitable Farm Management. Prentice-Hall. Englewood Cliffs, N.J.
2. Doane. Farm Management Guide. Doane Agricultural Service. St. Louis, Miss.
3. Rosenberg-Crank. Essentials of Business Law, 3rd Edition. Gregg Division. McGraw-Hill Inc.

Bulletins

College of Agriculture - Cornell University

988-Legal terms and obligations common to the farm business

1016-Incorporation of the farm business

861-Father and son partnership arrangements

892-Father and son arrangements on the farm

1202-The farmer and the lawyer

A.E. 568-Buying a farm on contract

Periodicals

Manual – Principles of agricultural finance.
The farm credit banks of Springfield, Mass.

Audiovisuals

MODULE OF INSTRUCTION

Title - FARM ORGANIZATIONS Code - 01.010407-01

DESCRIPTION:

Our American system functions on the rulings of majority rule, which involves the interaction of large groups. In turn, these groups result in strong organizations. Agriculture is an industry which relies heavily upon its organizations to teach and promote its business. Due to the nature of Production Agriculture, farmers have always been strongly individualistic. As a group they have found it economically necessary to turn to organizations which meet their specific needs.

These organizations may be local, state or national, as well as civic or agricultural.

Students taking this module will be involved with organizations which can accommodate their needs as farmers. Emphasis will be placed on local organizations. The work involved will deal primarily with meeting the leaders of these organizations and discussing their functions.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Organizations available to farmers	2	13
2. Specific uses of organizations to farmers	1	10
3. Using organizations to support the farmers' needs	1	3
	4	26

Revised June 1974

MODULE OF INSTRUCTION

Title - FARM ORGANIZATIONS Code - 01.010407-01

OBJECTIVES to be obtained:

The student will be able to:

1. Compile a list of no fewer than 30 organizations available to farmers.
2. List from memory five cooperatives, five agriculture organizations, and ten other organizations available to farmers.
3. Catagorize organizations into farmer cooperatives, civic organizations, youth organizations, other agricultural organizations, and list the major purpose of each.
4. Select three organizations that farmers should join. List three reasons why being a member of each organization would help the farmer.
5. Determine organization requirements for one farm organization. List the advantages that members have as a result of being active members.

[illegible] - 01.010407-01

[illegible] - FARM ORGANIZATIONS

OBJECTIVES BY UNIT	CONTENT
Unit 1 Organizations available to farmers. Objective 1 Compile a list of no fewer than 30 organizations available to farmers.	A. Cooperatives . Agway . Eastern Breeder's Inc. . Dairymen's League . Production Credit . Dairy Herd Improvement Coop. . Other Local Groups . Council of Farmer Cooperatives B. Farm Organizations . Farm Bureau, County-State-National . Cooperative Extension . Grange . Young Farmers and Ranchers . National Farmers Organization . Farm Workers Organization . Breed Associations . National Cattleman's Association . State Forestry Association . Local Fair Associations . State Exposition Committee . Farmers Home Administration . Soil Conservation Service . Agriculture Stabilization & Conservation Committee . Rural Electricification Association . New York Agriculture and Conservation Council . Fruit Commissions C. Other Civic Organizations D. Youth Organizations . FFA . 4-H . Grange
Objective 2 List from memory five cooperatives, five agriculture organizations, and ten other organizations available to farmers.	A. List five cooperatives associated with the agricultural industry in your area. B. List five agricultural organizations providing services to farmers in your area. C. Name ten other types of organizations in your community that are available to farmers.

01.010407-01 - Code

FARM ORGANIZATIONS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Short lecture on introduction. B. Supervised study. C. Class discussion. D. Guest speakers from as many of the different organizations as possible.	A. Note taking - lecture and guest speakers. B. Discussion. C. Compile list of organizations available for farmers.	A. Notebook grade. B. Written test on farm organizations, cooperatives, civic groups and youth organizations.
A. Chalk and Board B. Lecture C. Invite resource people from the various organizations to speak to class members. D. Filmstrips on cooperatives. E. Movies on agricultural organizations.	A. Students could attend organizations' annual meetings held locally. B. Attend governmental seminar for agricultural youth sponsored by New York Farm Bureau and State Education Department.	A. Notebook grade. B. Written test.

de - 01.010407-01

le FARM ORGANIZATIONS

OBJECTIVES BY UNIT	CONTENT
Objective 3 Catagorize organizations into farmer cooperatives, civic organizations, youth organizations, other agricultural organizations, and list the major purpose of each.	A. Cooperatives . List each and state functions B. Civic Organizations . List each and state functions C. Other Agricultural . List each and state functions D. Youth Organizations . List each and state functions
Unit 3 - Using organizations to support the farmers' needs. Objective 4 Select three organizations that farmers should join. List three reasons why being a member of each organization would help the farmer.	A. Personal preference of organization selection with regard to meeting the needs of a particular situation.
Objective 5 Determine organizational requirements for one farm organization. List the advantages that members have as a result of being active members.	A. Organization Requirements . Type of membership . Dues . Meeting dates, place and time . Other requirements B. Advantages of Membership . Marketing . Purchasing inputs . Insurance . Legislation . Credit source . Information

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study. B. Field trip to at least one cooperative. C. Guest speaker on how agricultural agencies and organizations serve the farmer. D. Field trip to at least one other agricultural organization.	A. Students can compile an organized list of agricultural cooperatives, agricultural organizations, civic organizations and youth groups.	A. Teacher evaluation of list. B. Oral quiz on the types of organizations, major purposes and functions.
A. Supervised study. B. Student's role playing, develop small discussion groups.	A. The student can select and justify three organizations for a given situation.	A. Teacher evaluation of student's role playing, discussion groups. B. Written examination, questions on specific situations. Students select organizations and support their choices with reasons.
A. Class discussion of organization membership requirements. B. Supervised study. C. Resource guest speakers that are members of organizations.	A. Student takes notes on discussion, supervised study and guest speakers. B. Select an organization that you feel would be beneficial. Explain the reasons for your selection.	A. Teacher evaluation of notebook. B. Evaluation of student's selection of an organization.

MODULE OF INSTRUCTION

Title - **FARM ORGANIZATIONS** Code - 01.010407-01

RESOURCE MATERIALS

Books:	Credit to Farmers, The Story of Federal Intermediate Credit Banks and Production Credit Associations, W.N. Stokes, Jr. Published by the Federal Intermediate Credit Banks, c/o Farm Credit Administration, Washington, D.C. 20578.
Bulletins:	How Agricultural Agencies and Organizations Serve the Farmer, S.U.N.Y - State Education Department, Agricultural Education Department.
Audiovisuals:	Selected list of professional and technical societies and organizations concerned with Agricultural Production and Its Application, Appendix C, pp. 691-692, Career Preparation in Agricultural Production, A Curriculum Guide for High School Vocational Agriculture, U.S. Department of Health, Education and Welfare, Office of Education. Published by Ohio Career Education and Curriculum Management Laboratory on Agricultural Education, The Ohio State University, Columbus, Ohio 43210.

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MODULE OF INSTRUCTION

Title - GOVERNMENT PROGRAMS FOR FARMERS Code - 01.010408-01

DESCRIPTION:

The dynamic field of agriculture is stimulated and supplemented by our government through educational assistance, specific services, and financial reimbursement. Many government supported programs promote a desire to enrich or conserve the soil, rebuild properties and protect the American consumer from possible encumbrances of which he is not aware.

The student will be involved with identifying programs that are available, and determining how to take advantage of the facilities and services available through government programs. He will be concerned with evaluating programs and making decisions regarding the programs of concern to him.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Government programs available to farmers	5	5
2. Providing services to farmers	1	3
3. Programs providing financial reimbursement to farmers	1	3
4. The American consumer and the farmer	5	3
5. Using programs to support the needs of farmers	2	2
	14	16

Revised 6/74

MODULE OF INSTRUCTION

Title - GOVERNMENT PROGRAMS FOR FARMERS Code - 01.010408-01

OBJECTIVES to be obtained:

The student will be able to:

1. List at least 10 different Government programs available to farmers.
2. Contact through written or personal communications, two agencies for the procurement of materials explaining the program provided, and forms to be used in requesting services or reimbursement of the agency.
3. Select five of the ten programs from objective No. 1, which are being used by local farmers.
4. Select from the list in objective No. 1 the programs providing services for farmers and explain how they influence agriculture.
5. Select three programs providing services to farmers, prepare an oral class report, discuss the effectiveness of each program.
6. Select from the list in objective No. 1, the programs providing financial reimbursement to farmers and how these programs can help farmers become established in farming and continue in farming.
7. Choose and write constructive criticisms to both support, and reject each of two government programs providing financial reimbursement and services to farmers.
8. Prepare a list of eight programs established to protect the American consumer, discuss the merits of each program.
9. Complete the forms requesting services or financial reimbursement of any three of the agencies contacted in objective No. 2.

Code - 01.010408-01

AGRICULTURAL

Title - GOVERNMENT PROGRAMS FOR FARMERS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Government program available to farmers. Objective 1 List at least 10 different Government programs available to farmers.	A. Programs - Soil Conservation Service Federal Land Bank Production Credit Federal Housing Administration Environmental Protection Agency Small Business Administration United States Department of Commerce United States Department of Interior New York State Planning Commission State-Federal-County Planning Agencies United States Department of Agriculture Others
Objective 2 Contact through written or personal communications, two agencies for the procurement of materials explaining the program provided, and forms to be used in requesting services or reimbursement of the agency.	A. Letter Writing - . Use correct form . Request information desired . Write neatly and accurately B. Interviewing - . Introduction - state your purpose for the interview . Ask valid questions . Be Precise . Time - arrange for appointment for interview . Record information

01.010408-01 - Code

GOVERNMENT PROGRAMS FOR FARMERS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A.Lecture B.Supervised study C.Guest speakers - as many different organizations as can possibly be arranged - no fewer than 5.	A.Students keep a module packet on this module. B.Prepare several questions - written - to be asked each speaker regarding the major area being discussed. FFA Leadership Activity. Students could prepare a youth power paper on careers in Government Services. Youthpower's sponsored by the Farm Bureau on the local, state and national levels.	A. Students will list 10 government programs available to farmers. B. Teacher evaluates the list. C. Extra credit for Youthpower Reports.
A. Lecture B. Supervised practice in letter writing. C. Supervised practice in interviewing. Teacher student role playing.	A.Take notes from lecture on business letters. B.Write a letter asking for information from one agency. C.Prepare an interview (written) outline. D.Role playing in class Employer-Agency and student interviews. Teacher could play the role of the government agency. All students could be exposed to this technique before actually arranging for their interview.	A.Teacher evaluation of letter. B.Teacher evaluation of interview outline. C.Grade on oral interview role playing.

Co - 01.010408-01

Title - GOVERNMENT PROGRAMS FOR FARMERS

OBJECTIVES BY UNIT	CONTENT
Objective 3 Select five of the ten programs from objective No. 1, which are being used by local farmers.	A.Programs now being used locally - •SCS •ASC •And content used in objective No. 1
Unit 2 -Providing Services to farmers Objective 4 Select from the list in Objective #1 the programs providing services for farmers and explain how they influence agriculture.	A.Farm Service Programs - .Soil & Water Management .Banking .Environment .Land Use
Objective 5 Select three programs providing services to farmers, prepare an oral class report, discuss the effectiveness of each program.	A.Personal choice under teacher guidance.

E D U C A T I O N

01.010408-01 - Code

GOVERNMENT PROGRAMS FOR FARMERS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Discussion C. Field trips to at least two farms which are carrying out programs sponsored by government agencies. D. Invite Resource personnel to the classroom.	A. Note taking B. Discuss existing programs familiar to the class. C. Prepare a list of programs now being used.	A. Written Test B. Notebook Grade
A. Supervised study through use of available references and notes from speakers. B. Student Report on agencies contacted.	A. Revision of existing list with explanation of types of service available to farmers. Students could research the career requirements for specific areas of employment in service agencies.	A. Teachers Evaluate list.
A. Supervised study B. Students prepare oral reports.	A. Give the report in class. B. Invite Guidance Counselor to hear the reports.	A. Teacher evaluation report. B. Student evaluation of his report after all reports are given.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Programs providing financial reimbursement to farmers Objective 6 Select from the list in objective #1 the programs providing financial reimbursement to farmers and how these programs can help farmers become established in farming and continue in farming..	A. Programs providing financial reimbursement to farmers. . Federal Land Bank . Production Credit . FHA . Small Business Bureau . Others
Objective 7 Choose and write constructive criticisms to both support, and reject each of two government programs providing financial reimbursement and services to farmers.	A. Selection of programs - . Financial Reimbursement . Services
Unit 4 - The American Consumer and the Farmer Objective 8 Prepare a list of eight programs established to protect the American consumer, discuss the merits of each program.	A. List of programs affecting consumer and farmer. . Pure food and Drug Regulations . USDA Meat Inspections . Milk Inspections . Weights and Measures Bureau of Agriculture and Markets . Others
Unit 5 - Using programs to support the needs of farmers Objective 9 Complete the forms requesting services or financial reimbursement of any three of the agencies contacted in objective No. 2.	A. Completion of applications - . Neatness . Accuracy . Completeness

01.010408-01 - Code

GOVERNMENT PROGRAMS FOR FARMERS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Supervised study through use of available references and notes from speakers. B. Teacher can invite young and adult farmers to talk to students regarding how they used some of the government programs.	A. Student revision of existing list with explanation of type service available to farmers.	A. Teacher evaluation of list. B. Students write a report on guest speakers comments.
A. Supervised study B. Prepare a panel discussion Divide the class into 4 groups. Let each group present their findings and recommendations.	A. Prepare panel discussion on two topics- B. Use the FFA Youth Leadership Farm Forum Format for student involvement and presentations	A. Teacher evaluations of written criticisms and recommendations. B. Grade on Farm Forum type presentations.
A. Lecture B. Guest Speaker C. Invite local or state agency people in consumer protection. Department of Agriculture & Markets.	A. Note taking B. List programs provided for the American consumer; select several to evaluate. C. Work in groups of two people Prepare written and oral reports on several programs.	A. Teacher evaluation of .Written Report .Oral Report .Answering questions
A. Supervised study B. Students review forms. With data provided by the instructor, complete sample forms.	A. Practice filling out forms which were received from the agencies contacted. B. Review actual forms that have been completed. Progressive Young Adult Farmers are pleased to allow teachers and students to use this information.	A. Teacher evaluation of completed applications.

MODULE OF INSTRUCTION

Title - GOVERNMENT PROGRAMS FOR FARMERS Code - 01.010408-01

RESOURCE MATERIALS

Bulletins - Any available from Department of Agriculture and Markets, State Campus, Albany, New York.
A Story of Milk, Milk Market Administration, 205 East 42nd Street, New York, New York 10017

Periodicals -

Doones Agriculture Reports
United States Department of Agriculture Reports
FHA Reports
Soil Conservation Service

Audiovisuals -

Film Strip - Evolution in Marketing Farm Products - California State Poly College - I.M.S.
"Careers In Government Services" - I.M.S.

Teachers should have their names put on the periodical list of mailing of the above governmental agencies.

MODULE OF INSTRUCTION

Title - Using Service Agencies

Code - 01.010499-01

DESCRIPTION:

There are many service agencies that provide information and assistance to farmers. These agencies can be listed in the categories of production, construction, financing, marketing and management. Agencies rendering such services include Extension Service, Production Credit Association, Soil Conservation Service, State College of Agriculture at Cornell and many others. Farmers must be able to use these agencies to be successful in their business.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Services Available to the Farmer	2	6
2. Agencies Providing Services to Farmers	2	6
3. Using Agencies to Solve Farm Problems	4	10
	8	22

Revised 8/75

MODULE OF INSTRUCTION

Title - Using Service Agencies Code - 01.010499-01

OBJECTIVES to be obtained:

The student will be able to:

1. Correctly list five categories of agencies providing services to farmers.
2. Correctly identify and list major services supplied by at least three local agencies within each category.
3. Select, to the satisfaction of the instructor, proper agencies to use when faced with a local situation requiring the use of agricultural agencies.
4. Demonstrate his ability to use an agency in at least two of the categories, by involving two agencies to assist the student in solving a problem, which has been approved by the instructor.
5. Develop a directory of local farm service agencies, which meets the instructors specifications.

Code - 01.010499-01

Title - Using Service Agencies

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Services Available to the Farmer Objective 1 Correctly list five categories of agencies providing services to farmers.	A. Educational Services . Cooperative extension . Adult farmer classes B. Financing Services . Federal land bank . Production credit . Local banks . Others C. Soil Conservation Services D. Production Services . Cooperatives . Company field representatives . Veterinarians E. Marketing Services . Cooperatives . milk marketing . livestock . farm supplies F. Farm Building Structures & Material Handling . Cooperatives . Private companies G. Farm Equipment & Machinery Dealers

E D U C A T I O N

01.010499-01 - Code

Using Service Agencies - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and Discussion	A. Student notes on Lecture, Class Discussion, Field Trips and Guest Speakers	A. Written test on service agencies available in the area.
B. Supervised Study	B. Collect information describing services supplied by local agencies compile materials in notebook form.	B. Notebook Grade
C. Field Trips	C. Develop a list of all farm service agencies in the community.	
D. Guest Speakers		

Code -- 01.010499-01

Title - Using Agriculture Service Agencies

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Agencies Providing Services to Farmers Objective 2 Correctly identify and list major services supplied by at least three local agencies within each category.	A. Production Services . Primary service agencies . Agriculture Conservation Program . College of Agriculture - Cornell . College of Agriculture - Penn. State . Dairy Herd Improvement Cooperative . Extension Service . Soil Conservation Service . State Department of Agriculture & Markets . Vocational Agriculture Department . other . Secondary service agencies . Artificial Insemination . Equipment Supplies Co. . feed & seed . fertilizer . machinery dealership . veterinarians . other B. Construction Services . Primary service agencies . Agriculture Conservation Program . College of Agriculture at Cornell Ag-Engineering Department . Extension Service . N.Y.S. Electric & Gas Corp. . Soil Conservation Service . Vocational Agriculture Department . other C. Marketing Services . Secondary service agencies . farm marketing cooperatives . local markets . other

EDUCATION

01.010499-01 - Code

Using Service Agencies - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion B. Small group information gathering sessions C. Field trips D. Guest speakers	A. Students will develop a list of agencies of use to local farmers and list the services provided by each. This can be done by: . Using references . Discussion of services used . Small group information gathering sessions . Securing information during field trip(s) . Gathering information from guest speaker(s)	A. Written quiz B. Evaluate lists developed by students.

Code - 01.010499-01

Title - Using Service Agencies

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Using Agencies to Solve Farm Problems Objective 3 Select to the satisfaction of the instructor, proper agencies to use when faced with a local situation requiring the use of Agricultural agencies.	A. Determine which agencies can best meet your needs . Availability in area . Service agencies in the area . Ability to work together . Cost . Time . Other

EDUCATION

01.010499-01 - Code

Using Service Agencies - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture - discussion	A. Students will solve a given problem, requiring them to select agencies to use in solving the problem.	A. Evaluation of a "given problem" student has solved - has he selected the correct agencies?
B. Individual work with students	B. Students present an actual (preferable) or hypothetical problem to the teacher for approval. The problem must require the services of two agencies to solve it.	B. Evaluation of problem (#2) the student solves.
C. Problem solving method	C. Students will contact the agencies and solve the problem. (Care should be taken that not too many students contact the same agency.)	C. Evaluation of directory the student prepares. . Completeness . Neatness . Is it in a usable form?
D. Field trips and guest speakers	D. Students will develop a directory of agencies that can be used by local farmers. The directory should include at least: . Name of agency . Name of person to contact . Telephone No. or how to reach . Address . Services provided (in outline form)	

Code - 01.010499-01

Title - Using Service Agencies

OBJECTIVES BY UNIT	CONTENT
Objective 4 Demonstrate his ability to use an agency in at least two of the categories, by involving two agencies to assist the student in solving a problem, which has been approved by the instructor.	A. Involving the agency . How to contact - telephone, letter, visit, forms to use . What information should be provided to agencies? . Determine how promptly the agency will act on the problem . Responsibilities incurred by accepting service . Expressing appreciation for services received
Objective 5 Develop a directory of local farm service agencies, which meets the instructor's specifications.	A. Educational B. Financial C. Soil Conservation D. Production E. Marketing F. Farm Building Structures & Materials Handling G. Farm Machinery and Equipment

EDUCATION

01.010499-01 - Cod

Using Service Agencies. Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher lead class discussion B. Supervised study C. Films on service agencies D. Guest speakers	A. Notes on lecture, class discussion, films, and guest speakers.	A. Given a specific situation that involves two Agricultural agencies, have the student select the agencies and reasons for his selections. B. Notebook grade
A. Class discussion B. Student reports	A. Compile a list of service agencies for notebook and future reference.	A. Notebook grade B. Written examination on local service agencies.

009328

009328

MODULE OF INSTRUCTION

Title - Using Service Agencies Code - 01.010499-01

RESOURCE MATERIALS

Bulletins

Teacher References

1. Soil Conservation Service - P.A. - No. 818 - USDA, SCS
2. What is a Farm Conservation Plan - P.S. - No. 629 - USDA, SCS
3. Assistance Available from the Soil Conservation Service - No. 345 - USDA - SCS
4. Cornell List of Extension Bulletins
    - Agriculture
    - Research
    - Economics
    - Engineering

Note: Most references will be obtained free at the local level. Cooperative Extension, for example, is responsible for promotion at the county level.

Student References

All those listed above as Teacher References

Note: Many references will be obtained locally from Service Agencies